Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

SHOUT
SHARE
IT

UNITED STATES DEPARTMENT OF AGRICULTURE

DEPARTMENT BULLETIN No. 1206

Washington, D. C. March 13, 1924

MARKETING SOUTHERN-GROWN SWEET POTATOES

By

GEORGE O. GATLIN, Associate Marketing Specialist
Bureau of Agricultural Economics

CONTENTS

	Page		Page
The Sweet-Potato Industry	1	Containers	22
Storage Facilities	4	Loading and Shipping Methods	26
Disposition of the Southern Crop	5	Outlets and Methods of Sale	34
Southern Commercial Varieties	7	Advertising	38
Car-Lot Movement and Distribution	8	Cooperative Marketing	39
Grading	13	Federal Services in Marketing	41
Packing	20	Recommendations	45

WASHINGTON
GOVERNMENT PRINTING OFFICE
1924

UNITED STATES DEPARTMENT OF AGRICULTURE

DEPARTMENT BULLETIN No. 1206

Washington, D. C. ▼ March 13, 1924

MARKETING SOUTHERN-GROWN SWEET POTATOES.

By GEORGE O. GATLIN, *Associate Marketing Specialist, Bureau of Agricultural Economics.*

CONTENTS.

	Page.		Page.
The sweet-potato industry	1	Containers	22
Storage facilities	4	Loading and shipping methods	26
Disposition of the southern crop	5	Outlets and methods of sale	34
Southern commercial varieties	7	Advertising	38
Car-lot movement and distribution	8	Cooperative marketing	39
Grading	13	Federal services in marketing	41
Packing	20	Recommendations	45

Eleven Southern States produce sugary, moist-fleshed sweet potatoes so unlike the dry, mealy varieties shipped from the northeastern section of the producing area that they are recognized as a distinct class or type on the principal markets of the United States. For many years the sweet potato has been the most important vegetable crop in the South, but only in recent years have southern growers and shippers undertaken to market an appreciable amount of the crop outside of the producing areas, especially in the large cities of the North and East.

They have succeeded in distributing southern sweet potatoes in practically all of the important car-lot markets of the country, but they have experienced many difficulties. The moist-fleshed varieties produced in this group of States are no more peculiar to the territory than are the marketing problems of southern growers and shippers. Many of them have overestimated the demand for their product and underestimated the need for economical production and better marketing practices.

THE SWEET-POTATO INDUSTRY.

THE NORTHEASTERN SECTION.

The principal sweet-potato producing States may be grouped into sections, according to their geographical position, the varieties of sweet potatoes grown, and the purpose for which the crop is produced. The northeastern section, composed of New Jersey, Delaware, Maryland, and Virginia, produces primarily for the market and is the main source of the commercial supply. The varieties

shipped are the dry-fleshed varieties of the Jersey group. Production is concentrated in a few counties in the southern portions of New Jersey and Delaware, the Eastern Shore and tidewater counties of Maryland, and the Eastern Shore section of Virginia. With established market varieties, relatively short freight hauls, efficient sales practices, established trade connections, and a reputation for shipping stock that is fairly uniform, relatively well graded, and well packed, the northeastern section succeeds in marketing approximately 71 per cent of its production. It produces less than 10 per cent of the total crop but ships more than 65 per cent of the total car-lot movement.[1]

THE SOUTHERN SECTION.

The 11 States which compose the southern section are Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas, all of which produce and ship the moist, sugary varieties.

While moist-fleshed varieties predominate in North Carolina, there is a small district in the northeastern corner of the State, mainly in Currituck County, which produces Jersey type stock for the early market, under conditions similar to those prevailing in the northeastern section.

The bulk of the southern crop is grown for local consumption rather than for shipment, but the territory adapted to commercial production is as large as and almost identical with the Cotton Belt. The fact that commercial production is developing over this wide area rather than in a few restricted districts complicates the marketing problem. With a general reputation for poor grading, loose packing, unattractive containers, and improper car loadings, southern shippers have made little progress in stimulating the demand for southern sweet potatoes, particularly in consuming centers which do not know and appreciate the merits of the product. The southern section produces over 83 per cent of the entire crop, but ships only approximately 30 per cent of the total car-lot shipments. It markets in car lots less than 4 per cent of its production.

OTHER SECTIONS.

In Kentucky, southern Illinois and Indiana, Iowa, Kansas, Missouri, New Mexico, and California there are relatively small areas which ship in car lots. Any one of them may become commercially important in a very short period of time, but at present they are minor sections. Their combined shipments amount to less than 5 per cent of the car-lot movement.

THE SITUATION IN THE SOUTH.

There has been a constant increase in production in the United States since 1899, and a decidedly rapid increase since 1914. Most of this increase has occurred in the southern section, and to a considerable extent is due to the movement for diversification in the Cotton Belt and the development of practical sweet-potato storage houses. The industry was further stimulated by war demands and war prices.

[1] Car-lot production figures in this bulletin were obtained by reducing production in bushels, as estimated by the United States Department of Agriculture, to car lots on the basis of 600 bushels to the car. Car-lot-movement figures are based on actual shipments as reported to the department by the railroad companies. Comparisons between car-lot production and car-lot shipments are, therefore, approximately rather than actually correct.

The transition which is occurring from production for home consumption to production for the market has been too rapid, especially in view of the fact that few constructive efforts have been made to

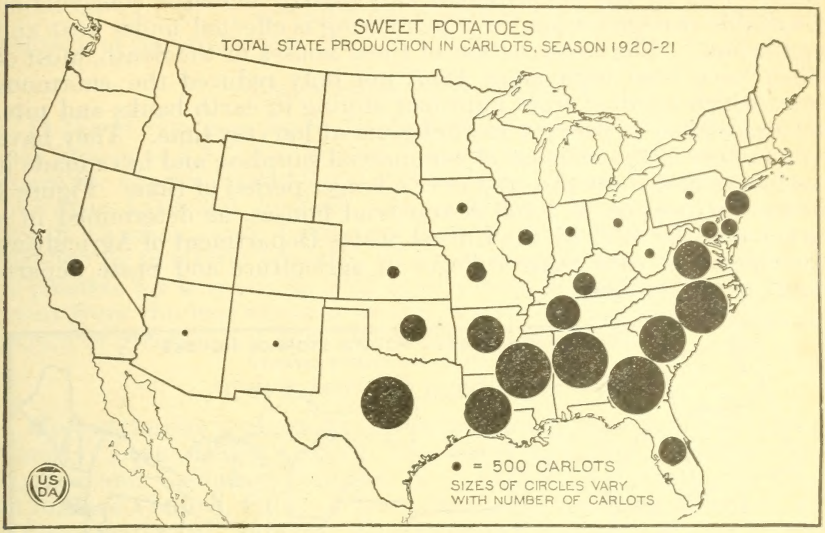

FIG. 1.—The 11 States of the southern section produce over 83 per cent of the total sweet-potato crop, but market less than 30 per cent of the total carlot shipments. See Figure 2.

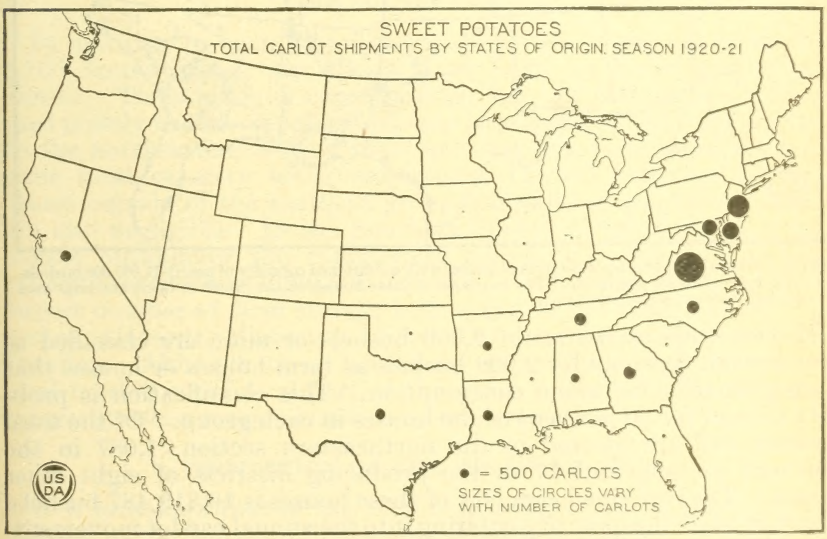
SWEET POTATOES
TOTAL CARLOT SHIPMENTS BY STATES OF ORIGIN, SEASON 1920-21
● = 500 CARLOTS
SIZES OF CIRCLES VARY
WITH NUMBER OF CARLOTS
US DA

FIG. 2.—The four States of the northeastern section produce less than 10 per cent of the total sweet-potato crop, but ship more than 65 per cent of the total carlot shipments. See Figure 1.

stimulate demand. Since 1914 production in the South has more than doubled. The extent of the industry and the relative commercial importance of the different sections are shown in Figures 1 and 2.

STORAGE FACILITIES.

COMMERCIAL CURING AND STORAGE HOUSES.

A lengthening of the marketing season has been brought about in recent years by the development and greatly increased construction of suitable storage houses, in which curing is effected under heat and ventilation.[2] The construction of these houses in the South, most of which have been built since 1917, not only reduced the enormous losses which resulted from improper storing in earth banks and pits, but has tended to prevent market gluts at harvest time. They have been factors in the increase of commercial supplies, and have made it possible to distribute the crop over a longer period of time. Figure 3 shows the location of 1,406 commercial houses, as determined in a survey made in 1922 by the United States Department of Agriculture in cooperation with State colleges of agriculture and State departments of agriculture.

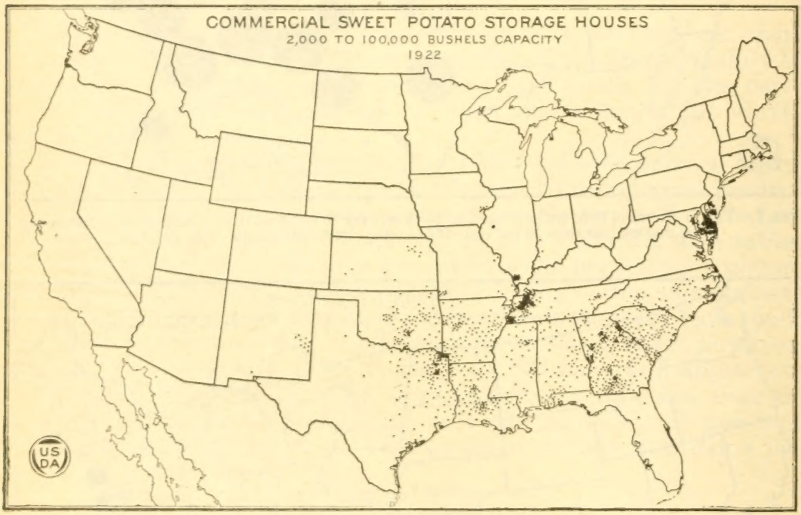

FIG. 3.—Commercial sweet-potato storage houses with a combined capacity of nearly 11,000,000 bushels. Each dot represents one house. The locations of these houses in the South indicate the large area adapted to commercial production.

Houses with capacities of 2,000 bushels or more are classified as commercial, those under 2,000 bushels as farm houses or houses that store primarily for home consumption. This classification is probably correct for 90 per cent of the houses in each group. Of the total number 242 are located in the northeastern section, 1,087 in the southern section, and 77 in the producing districts of eight other States. The combined capacity of these houses is 10,819,487 bushels, which exceeds the quantity entering into the annual car-lot movement.

STORAGE FACILITIES IN THE NORTHEAST.

In the four States of the northeastern section the combined capacity of the 242 houses is 2,207,137 bushels. More than half of this is in two counties in Delaware—Sussex and Kent. The remaining facili-

[2] See United States Department of Agriculture, Farmers' Bulletin 970: Sweet-Potato Storage, by H. C. Thopsomn. 1918.

ties are mainly in two counties in New Jersey and in a restricted area in the eastern section of Maryland. There are a few houses in the Eastern Shore section of Virginia, but they are small and their combined capacity is relatively unimportant. Although the northeastern section has a total storage space much smaller than that of the southern section, it actually has facilities for storing a larger percentage of its production.

STORAGE FACILITIES IN THE SOUTH.

In the 11 Southern States the combined capacity of 1,087 commercial houses is 7,957,850 bushels. Georgia ranks first, with storage space for approximately 2,000,000 bushels. Texas has storage space for over 1,000,000 bushels, and Arkansas, Louisiana, Oklahoma, South Carolina, and Tennessee each have facilities ranging from 500,000 to 1,000,000 bushels. With so many houses in the South it is possible for shippers to hold their stocks during the heavy movement from the northeastern section and to market them during the period of greatest demand, December to April, inclusive.

STORAGE FACILITIES IN OTHER SECTIONS.

Most of the storage houses in other producing States are in Muscatine County, Iowa; Union County, Ill.; Knox and Vigo Counties, Ind.; Graves and Calloway Counties, Ky.; Roosevelt County, N. Mex.; Stanislaus County, Calif.; a few counties in southern Missouri; and a few counties in Kansas. The combined capacity of the 77 commercial houses in these eight States is 654,500 bushels.

FARM STORAGE FACILITIES.

In addition to commercial storage facilities, there are more than 1,700 houses which are classified as farm or individual storage houses. These range in capacity from 100 to 2,000 bushels, and are used mainly to store supplies for home consumption and local markets. In the northeastern section there are very few farm storage houses, their total capacity being only about 125,000 bushels. In other States outside of the southern group the number and total capacity are also negligible. In the Southern States, however, farm storage houses outnumber the commercial houses and have a combined capacity exceeding 1,200,000 bushels. The States that have the largest number of farm storage houses are, in the order named, Tennessee, Alabama, Mississippi, North Carolina, Louisiana, and South Carolina. Although these houses are generally used for home and local market supplies, a part of the stock is available for shipment, especially when market conditions are favorable.

DISPOSITION OF THE SOUTHERN CROP.

It is estimated that of the 1920 crop 3.7 per cent of the total production in the Southern States was shipped in car lots, 19.3 per cent sold in small lots in near-by markets, 37 per cent consumed on the farms, 9.5 per cent fed to livestock, 5.5 per cent saved for seed, and 25 per cent lost from freezing, disease, and other causes. Estimates of the disposition of the southern crop are based on replies to questionnaires sent to agricultural officials and other well-informed men connected with the industry in their respective States.

LOCAL SALES.

Sales in near-by markets are mainly small lots of field-run stock sold by individual growers to retail merchants. Some growers dispose of their surplus by also selling direct to housekeepers, restaurants, hotels, and institutions that use comparatively large quantities. In some districts local marketing includes sales to canning factories and sales on public markets of near-by cities. The entire stocks of a few favorably situated storage houses are disposed of by marketing them locally in the late winter and spring, using motor trucks for delivery, direct to merchants in conveniently located towns and cities.

Inasmuch as there is a period of several months during the year when many southern towns and cities are without an adequate supply of sweet potatoes, it would seem that more storage-house operators would find it desirable to cater to this neighboring demand. Florida markets approximately 40 per cent of its crop within the State, North Carolina about 28 per cent, Louisiana about 25 per cent, and Texas about 20 per cent. In other States of the southern group less than 20 per cent of the crop is marketed locally.

HOME CONSUMPTION.

That the sweet potato is one of the most important food crops in the South is indicated by the fact that approximately 37 per cent of the large southern production is consumed on the farms. This 37 per cent of the South's production is larger than the total production of all other States. The quantity used both for home consumption and local sales is practically twice as large as the total production of all other shipping sections. In no other section is the per capita consumption so large.

CONSUMPTION BY LIVESTOCK.

Most of the sweet potatoes fed to animals are consumed by hogs. In some sections fields are either "hogged off" or gleaned at harvest time. Culls and jumbos are sometimes stored and fed in the feed lots as either the main or a supplementary ration. These practices are more general in Louisiana, South Carolina, and Mississippi than in any other of the States. Louisiana feeds about 17.5 per cent of its crop, South Carolina about 15 per cent, and Mississippi about 11.5 per cent. An effort is being made by agricultural leaders to encourage the feeding of culls and low-grade stock, and it is probable that a much larger proportion of the crop will be utilized in this way in the future.

SALES TO CANNING FACTORIES.

The quantity of sweet potatoes canned in factories and on farms is such a small part of the total production that no attempt has been made to estimate it separately from local sales. There are, however, numerous canning factories in the South that pack sweet potatoes as one of their principal products. Many small factories can them exclusively. That the industry is growing is shown by the fact that in 1920 the total pack of the United States, according to the best figures obtainable, was 473,384 cases, which is almost twice as large as the 1917 pack.[3]

[3] See United States Department of Agriculture Bulletin 1041: A Study of Sweet Potato Varieties with Special Reference to Their Canning Quality, by C. A. Magoon and C. W. Culpepper. 1922.

Growers located near factories ordinarily prefer to sell to them rather than ship to distant markets. Little handling and expense are involved. Bulk-loaded wagons, trucks, or box cars are generally used in delivering the crop, strict grading is not required, and cash is paid on delivery. Most southern canners prefer to buy the firmer southern varieties, as all moist, sugary varieties become soft when cooked and stored.

THE ANNUAL LOSS.

The estimate of the amount of the 1920 southern crop not utilized was one-fourth of the production. This means that the quantity of southern sweet potatoes lost on account of freezing, disease, and other causes is larger than the total production in New Jersey, Delaware, Maryland, and Virginia. Although a loss of 25 per cent of the crop is large, this figure is believed to be below normal, partly because of unusual conditions during the 1920–21 season and partly because of improved storage facilities.

SOUTHERN COMMERCIAL VARIETIES.

CHARACTERISTICS OF SOUTHERN VARIETIES.

The principal commercial varieties of southern sweet potatoes are the Porto Rico, Nancy Hall, Triumph, and Dooley. The first two of these make up over 90 per cent of the car-lot shipments. The Triumph, which is shipped from a small district in southern Alabama at the beginning of the season, is medium-moist to dry, fairly sweet, and firm in texture. The other varieties, which constitute the main southern crop, are very sweet, moist, and soft in texture when cooked. It is these very sweet, moist-fleshed varieties that are referred to on the principal markets as southern sweet potatoes, as distinguished from the dry, mealy varieties of the Jersey group. They are sometimes called "yams," a term used to indicate their characteristics and southern origin, although the name is applied properly only to a distinct class of plants which are almost unknown in the United States.[4]

PREFERENCES IN PRODUCING STATES.

From 90 to 99 per cent of the car-lot shipments from Georgia, South Carolina, Louisiana, and Texas are the Porto Rico. From 90 to 95 per cent of the car-lot shipments from Tennessee, Arkansas, and Oklahoma are the Nancy Hall. In Alabama the principal commercial varieties are, in the order named, Triumph, Porto Rico, and Nancy Hall. Mississippi ships the Porto Rico and Nancy Hall in about equal quantities. In Florida the Porto Rico predominates, and in North Carolina the principal southern varieties shipped are the Porto Rico, Nancy Hall, and Southern Queen, known locally as Hayman. The largest production of the Dooley is in Louisiana. Of the total car-lot movement of southern sweet potatoes it is estimated that 57 per cent is the Porto Rico variety, 35 per cent Nancy Hall, 5 per cent Triumph, and 3 per cent other varieties.

[4] Varieties are classified and described in United States Department of Agriculture Bulletin 1021: Group Classification and Varietal Descriptions of American Varieties of Sweet Potatoes, by H. C. Thompson and James H. Beattie. 1922.

PREFERENCES IN CONSUMING MARKETS.

In the markets of the South the Porto Rico is the most popular variety. In other sections of the United States the Nancy Hall is the best known and most popular of the southern varieties. In the eastern markets "north of Virginia and east of Ohio" the dry-fleshed Jersey stock is desired, and there is no decided preference for any one southern variety. In the central or northern markets—north of Tennessee and east of the Mississippi River—the Nancy Hall is the most popular southern variety. Jersey type stock is preferred, but the preference is not so positive as it is in the East. West of the Mississippi River the Nancy Hall is the favorite, but preferences are not so firmly established as in other sections.

In certain markets in all of these groups of States exceptions occur; for instance, in sections that prefer the Nancy Hall there are cities that pay higher prices for the Porto Rico. The Porto Rico has gained rapidly in popularity since 1919, especially in the western markets and to some extent in the East. Existence of market preferences and the fact that they may be changed within a comparatively short time through advertising, changed standards of quality, and other conditions, are factors that vitally affect distribution, sales policies, and shipping-point practices. Table 1 shows the answers of 279 representative dealers to the question: What variety of southern sweet potatoes do you prefer to handle?

TABLE 1.—*Results of a questionnaire sent to 542 sweet-potato dealers in the principal markets of 31 States, 1921.*

Question.	Eastern markets (76 dealers reporting).	Central markets (87 dealers reporting).	Western markets (79 dealers reporting.)	Southern markets (37 dealers reporting).	Total (279 dealers reporting).	Percentage.
What variety of Southern sweet potato do you prefer to handle?						
Nancy Hall	33	66	60	12	171	66.8
Porto Rico	21	4	20	28	73	28.5
Other varieties [1]	9	3			12	4.7
What style of container do you prefer?						
Barrel	39	15	10	6	70	20.9
Bushel crate	13	8	14	9	44	13.2
Bushel hamper	33	63	35	5	136	40.7
Bushel basket	4	8	36	2	50	15.0
5-peck crate	2				2	0.6
Sacks			10	11	21	6.3
Bulk shipment				11	11	3.3
Can you use sweet potatoes over 3½ inches in diameter and 10 inches in length?						
Yes	2			1	3	1.3
No	46	63	58	16	183	81.0
Limited quantity	8	7	14	11	40	17.7

[1] 12 dealers stated that they did not want any southern variety, but preferred stock of the Jersey type from New Jersey, Maryland, and Virginia.

CAR-LOT MOVEMENT AND DISTRIBUTION.

SHIPPING SEASON.

Alabama opens the shipping season in July with a movement of the Triumph variety from the southern part of the State. Two or three weeks later Yellow Jersey stock begins to move from the small district in northeastern North Carolina, which produces this variety for the early market. About the time the North Carolina movement is well under way the Eastern Shore of Virginia begins to ship the same variety under the name of Early Carolina, and Little-Stem Jersey. New Jersey follows with its Big-Stem Jersey, Red Jersey, and other dry-fleshed varieties. The principal movement of the

Porto Rico, Nancy Hall, and other moist-fleshed varieties begins the latter part of August and continues through May. Over 95 per cent of the sweet-potato crop is harvested during September, October, and November, and half of the total car-lot shipments occur in these three harvest months. Stored stocks are shipped in the winter and spring, the heaviest movement beginning in December and ending in April. Tables 2, 3, and 4 give the monthly and yearly shipments, by States of origin, for the 1919–20, 1920–21, and 1921–22 seasons.

TABLE 2.—*Car-lot shipments of sweet potatoes, by States of origin, crop year 1919–20.*

State.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
New Jersey	.....	18	243	261	226	422	295	227	286	135	93	31	2,237
Delaware	.....	.....	.....	11	29	251	315	181	223	132	69	1	1,212
Maryland	.....	24	151	234	179	201	186	107	63	20	14	.....	1,179
Virginia	.....	626	2,162	1,708	1,128	100	5	4	1	.....	6	.....	5,740
North Carolina	14	325	54	30	54	17	37	22	45	63	88	1	750
Georgia	.....	3	1	13	18	37	94	96	58	82	72	1	475
Florida	.....	6	.....	3	6	1	.....	4	18	3	1	.....	42
Indiana	.....	.....	.....	6	2	1	.....	.....	4	8	6	.....	27
Illinois	.....	.....	.....	2	35	110	72	32	27	24	15	.....	317
Iowa	.....	.....	2	11	.....	.....	.....	.....	.....	.....	.....	.....	13
Missouri	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Kansas	.....	.....	.....	.....	.....	.....	1	3	.....	1	.....	.....	5
Kentucky	.....	.....	.....	.....	1	1	1	.....	.....	3	.....	.....	6
Tennessee	.....	26	26	40	121	138	152	163	270	213	46	17	1,212
Alabama	29	176	45	26	13	5	7	18	15	42	25	.....	401
Mississippi	.....	.....	18	26	24	17	6	.....	3	1	.....	.....	95
Louisiana	.....	5	28	21	66	13	31	6	5	27	9	.....	211
Texas	.....	7	42	107	195	30	44	28	20	18	3	.....	494
Oklahoma	.....	.....	.....	.....	4	.....	.....	.....	.....	9	6	.....	19
Arkansas	1	.....	1	9	78	21	63	48	98	35	1	.....	355
New Mexico	.....	.....	.....	4	2	1	10	10	7	.....	.....	.....	34
California	.....	10	131	217	130	86	48	10	7	1	.....	.....	640
Unknown	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Total	44	1,228	2,904	2,729	2,311	1,452	1,368	959	1,150	817	454	51	15,467

TABLE 3.—*Car-lot shipments of sweet potatoes, by States of origin, crop year 1920–21.*[1]

State.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
New Jersey	.....	9	329	402	275	561	479	389	343	75	55	16	2,933
Delaware	.....	.....	6	58	82	368	486	330	239	155	66	9	1,799
Maryland	.....	4	176	255	153	230	277	215	112	32	18	1	1,473
Virginia	.....	52	1,715	1,925	1,414	122	81	74	98	41	9	2	5,533
North Carolina	.....	304	180	51	48	21	48	60	99	58	15	.....	884
South Carolina	.....	.....	.....	1	.....	.....	3	10	20	18	6	.....	58
Georgia	2	25	53	36	53	98	141	140	181	122	100	15	966
Florida	.....	22	3	10	6	8	3	6	10	10	.....	1	79
Indiana	.....	.....	.....	.....	.....	5	10	13	10	3	.....	.....	41
Illinois	.....	.....	.....	.....	18	20	7	2	5	.....	.....	.....	52
Iowa	.....	.....	7	2	.....	3	1	1	.....	1	.....	.....	15
Missouri	.....	.....	2	.....	.....	.....	2	5	8	3	.....	.....	20
Kansas	.....	.....	.....	5	4	6	.....	.....	1	3	.....	.....	19
Kentucky	.....	.....	.....	2	2	.....	1	.....	.....	1	.....	.....	6
Tennessee	.....	16	53	48	50	125	177	100	104	104	94	27	898
Alabama	81	157	48	32	33	22	6	20	31	34	17	1	482
Mississippi	.....	4	6	8	32	6	1	2	6	3	2	4	74
Louisiana	.....	34	29	114	115	56	57	47	65	86	44	.....	647
Texas	2	43	61	103	125	65	97	70	39	16	1	.....	622
Oklahoma	.....	.....	6	6	10	7	7	14	20	10	3	.....	83
Arkansas	.....	.....	3	25	72	60	109	104	104	17	4	.....	498
New Mexico	.....	.....	.....	2	.....	.....	5	10	7	.....	.....	.....	24
California	.....	16	123	253	165	99	37	12	3	.....	.....	.....	708
Unknown	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	2
Total	85	686	2,800	3,338	2,658	1,882	2,035	1,624	1,506	792	434	76	17,916

[1] Subject to slight revision.

TABLE 4.—*Car-lot shipments of sweet potatoes, by States of origin, crop year 1921–22.*

State.	July.	August.	September.	October.	November	December.	January.	February	March.	April.	May.	June.	Total.
New Jersey	.....	84	383	394	254	356	260	195	163	74	35	17	2,215
Delaware	.....	.....	8	39	128	473	369	325	255	111	17	3	1,728
Maryland	.....	62	174	273	100	244	154	140	99	32	11	2	1,291
Virginia	3	881	1,657	1,697	727	68	14	16	25	17	8	.....	5,113
North Carolina	47	399	64	68	43	87	54	75	71	65	37	4	1,014
South Carolina	.....	.....	.....	5	2	5	15	25	30	42	13	.....	137
Georgia	4	42	32	82	97	161	203	185	172	169	179	23	1,349
Florida	7	49	1	1	2	2	8	7	12	7	9	.....	105
Indiana	.....	.....	.....	3	1	21	20	1	14	4	1	.....	65
Illinois	.....	.....	.....	2	49	62	29	5	2	2	.....	.....	151
Iowa	.....	.....	20	34	5	5	4	.....	.....	.....	.....	.....	68
Missouri	.....	.....	1	.....	.....	3	.....	1	4	1	1	.....	11
Kansas	.....	.....	1	7	2	18	6	1	3	3	.....	.....	41
Kentucky	.....	.....	1	8	17	23	6	6	21	8	3	1	94
Tennessee	.....	36	119	157	73	160	205	223	288	166	75	[1] 73	1,575
Alabama	153	200	27	44	47	19	5	8	15	48	41	10	617
Mississippi	1	19	10	21	24	22	9	17	12	17	8	2	162
Louisiana	8	72	77	61	112	91	103	102	78	92	106	56	958
Texas	2	57	112	126	83	55	80	66	96	55	20	3	755
Oklahoma	.....	.....	27	37	7	5	10	11	27	15	8	2	149
Arkansas	.....	.....	16	77	40	54	85	71	94	87	52	2	578
New Mexico	.....	.....	2	6	.....	4	5	5	14	9	6	6	57
California	.....	50	201	263	232	90	73	41	36	12	2	.....	1,000
Total	225	1,951	2,933	3,405	2,045	2,028	1,717	1,526	1,531	1,036	632	[1] 204	19,233

[1] Includes 13 cars in July.

NORTHEASTERN CAR-LOT MOVEMENT.

The peak movement from the northeastern section occurs in September and October, after which there is a constant decrease, month by month, until the end of the season. Virginia begins shipping in August, and during September, October, and November markets practically its entire commercial crop, the monthly shipments in this period ranging from 1,000 to over 2,000 cars. In December and January the volume of shipments drops to about 100 cars a month and during the remainder of the season they are comparatively unimportant. Shipments from Virginia constitute half of the total car-lot movement for the first six months of the shipping season. Its movement each year exceeds 5,000 cars, which is larger than the combined shipments from the 11 Southern States. Ninety per cent or more of this movement originates in the Eastern-Shore section. Beginning in August the New Jersey crop is marketed throughout the season, the heaviest movement being from November to March, inclusive. The movement from Maryland is also distributed rather evenly throughout the season, but the period of heaviest shipments begins earlier in the season. Delaware, which stores more stock than the other three States combined, ships few cars until after the heavy Virginia movement is over. The bulk of its crop is marketed over the five-months' period from December to April.

SOUTHERN CAR-LOT MOVEMENT.

The early shipments from the South are made up of the Triumph variety from Alabama, the Yellow Jersey from North Carolina, and a few cars from small districts in other States which grow limited quantities of dry-fleshed varieties for the early market in the North and East. Florida is rapidly increasing its acreage of Jersey type stock, and other sections, which are at a disadvantage in market-

ing stored supplies, are giving more attention to the early market. In Alabama about half of the total shipments are green stock, and the Triumph makes up about 90 per cent of its early shipments. July and August are the months of heaviest shipments. In North Carolina the peak movement for the season occurs in August. Approximately half of the total shipments from the State are the Yellow Jersey variety, which is shipped in this one month. The early movement of typical southern varieties is relatively unimportant, but they are heavy during September, October, and November. In addition to Alabama and North Carolina, there are four other southern States which have their peak movements during the harvest months—Florida, Mississippi, Louisiana, and Texas. The principal movement of southern sweet potatoes, however, begins at harvest time and continues through May. Tennessee and Georgia, the two heaviest shipping States, market the bulk of their crops more or less evenly over a period of six months—from November to April. Of the total car-lot movement from the South approximately 50 per cent of the shipments are in January, February, March, and April; about 30 per cent in September, October, November, and December; and about 20 per cent in May, June, July, and August. The peak movement is in March. Shipments are increasing each year and have more than doubled since the 1918-19 season.

CAR-LOT MOVEMENT FROM OTHER SECTIONS.

Competition from the small commercial sections of other States does not materially affect the southern movement. Total shipments from these sections are relatively small, although they are increasing. During the 1920–21 season the movement amounted to 885 cars; in 1921–22 it was increased to 1,487 cars. The bulk of the shipments originate in California and move during September, October, November, December, and January. Iowa ships in October and November, Illinois and Indiana mainly in the late fall, Kentucky and Kansas in the late fall and winter, and New Mexico in the winter and spring.

CAR-LOT DISTRIBUTION.

While the Jersey varieties of the northeastern section are available, there is little demand for southern sweet potatoes in northern and eastern markets. Although a considerable number of cars are distributed in this territory during the winter and spring, it seems that shippers have not made much progress in popularizing southern varieties and in increasing consumption. In the 1919–20 season, 12 of the leading markets in the United States, most of which are in the North and East, received 41.9 per cent of the total car-lot shipments of all sections; in 1920–21 they received 34.4 per cent, and in 1921–22 they received 30.9 per cent.

These markets are New York, Chicago, Philadelphia, Pittsburgh, St. Louis, Cincinnati, St. Paul, Minneapolis, Kansas City, Washington, Baltimore, and Boston. Only about 20 per cent of the arrivals originated in the South and the bulk of these were received in Cincinnati, St. Louis, and Kansas City. These three markets are the only ones in the group that receive over half of their supplies from the Southern States.

Although the car-lot movement has increased each year, the total arrivals in these 12 markets has not increased in proportion; in fact,

the percentage of arrivals has actually decreased. This situation may be explained in part by the fact that certain small cities that formerly obtained supplies from these large car-lot markets now buy straight cars direct from producing sections. Failure to develop a demand and increase distribution in the large consuming centers has been disappointing to southern growers and shippers, especially in the South Atlantic States. Tables 5, 6, and 7 show arrivals in 12 markets, by States of origin, for three consecutive seasons.

TABLE 5.—*Car-lot arrivals of sweet potatoes in 12 leading cities, by States of origin, September 30, 1919–May 25, 1920.*

State.	New York.	Chicago.	Philadelphia.	Pittsburgh.	St. Louis.	Cincinnati.	St. Paul.	Minneapolis.	Kansas City.	Washington.	Baltimore.	Boston.
New Jersey	695	150	1	57	.....	2	10	9	.....	.....	.....	18
Delaware	206	75	223	424	.....	25	.....	1	.....	7	7	117
Maryland	299	2	129	159	.....	1	.....	.....	.....	55	129	37
Virginia	875	182	93	298	4	77	15	52	17	39	86	299
North Carolina	5	1	5	1	.....	103	.....	.....	.....	84	26	17
South Carolina	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Georgia	2	3	.....	37	9	30	.....	.....	4	11	5	2
Florida	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	6
Illinois	.....	153	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Indiana	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Kentucky	.....	4	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Tennessee	9	360	.....	6	69	206	8	26	16	.....	.....	.....
Alabama	1	9	.....	2	9	65	1	2	28	.....	.....	.....
Mississippi	.....	8	.....	.....	8	4	.....	.....	.....	.....	.....	.....
Louisiana	.....	23	.....	1	7	3	1	.....	7	.....	.....	.....
Texas	.....	1	.....	.....	3	1	.....	.....	8	.....	.....	.....
Oklahoma	.....	.....	.....	.....	.....	.....	1	.....	8	.....	.....	.....
Arkansas	.....	30	.....	.....	32	1	.....	4	125	.....	.....	.....
Unknown	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Total	2,092	1,003	452	985	141	520	36	94	213	197	254	498

TABLE 6.—*Car-lot arrivals of sweet potatoes in 12 leading cities, by States of origin, August 24, 1920–May 31, 1921.*

State.	New York.	Chicago.	Philadelphia.	Pittsburgh.	St. Louis.	Cincinnati.	St. Paul.	Minneapolis.	Kansas City.	Washington.	Baltimore.	Boston.
New Jersey	15	261	3	108	.....	12	9	13	.....	.....	.....	110
Delaware	66	114	185	380	.....	17	.....	.....	.....	11	3	85
Maryland	120	31	96	152	.....	.....	2	3	.....	56	60	50
Virginia	1,226	204	226	273	4	136	22	36	7	32	15	428
North Carolina	31	.....	14	46	.....	52	.....	1	.....	19	30	61
South Carolina	1	.....	.....	10	.....	.....	.....	.....	1	1	.....	.....
Georgia	3	9	.....	34	7	14	1	.....	5	20	5	4
Florida	.....	.....	1	1	.....	8	.....	.....	2	.....	.....	.....
Illinois	.....	78	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Indiana	.....	16	.....	.....	.....	6	.....	.....	.....	.....	.....	.....
Missouri	.....	.....	.....	.....	1	.....	.....	1	2	.....	.....	.....
Kansas	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....
Kentucky	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee	.....	330	.....	2	78	145	9	29	6	.....	.....	.....
Alabama	.....	23	.....	5	21	37	.....	.....	13	.....	.....	.....
Mississippi	.....	9	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
Louisiana	.....	15	.....	.....	18	.....	1	2	14	.....	.....	.....
Texas	.....	4	.....	.....	.....	.....	.....	.....	7	.....	.....	.....
Oklahoma	.....	1	.....	.....	.....	.....	.....	1	23	.....	.....	.....
Arkansas	.....	17	.....	.....	61	.....	4	2	142	.....	.....	.....
Unknown	2	22	1	10	.....	26	2	8	7	3	.....	1
Total	1,464	1,140	526	1,021	191	455	50	97	230	142	113	739

TABLE 7.—*Car-lot arrivals of sweet potatoes in 12 leading cities, by States of origin, August 23, 1921–May 26, 1922.*

State.	New York.	Chicago.	Philadelphia.	Pittsburgh.	St. Louis.	Cincinnati.	St. Paul.	Minneapolis.	Kansas City.	Washington.	Baltimore.[1]	Boston.
New Jersey	5	297	.....	126	.....	3	17	30	.....	2	.....	17
Delaware	86	84	162	394	.....	11	1	.....	.....	10	1	147
Maryland	190	15	73	94	.....	.....	.....	.....	.....	34	130	73
Virginia	980	150	95	277	1	71	5	38	3	22	67	421
North Carolina	39	7	11	14	.....	11	.....	2	.....	53	20	47
South Carolina	23	.....	3	2	.....	.....	.....	.....	.....	16	3	.....
Georgia	29	1	2	31	3	17	3	7	2	43	23	4
Florida	.....	6	.....	.....	2	3	1	2	.....	.....	.....	.....
Illinois	.....	138	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kentucky	.....	45	.....	.....	2	7	.....	1	.....	.....	.....	.....
Tennessee	2	411	.....	.....	78	224	22	29	8	.....	.....	4
Alabama	1	27	1	28	11	16	1	1	3	.....	1	.....
Mississippi	.....	13	.....	1	11	6	1	3	2	.....	.....	.....
Louisiana	.....	4	.....	.....	1	.....	1	5	16	.....	.....	.....
Texas	.....	1	.....	.....	.....	.....	1	1	10	.....	.....	.....
Oklahoma	.....	.....	.....	.....	.....	.....	.....	.....	8	.....	.....	.....
Arkansas	.....	14	.....	1	31	.....	6	7	123	.....	.....	.....
All other	.....	18	.....	.....	1	2	.....	4	3	.....	.....	.....
Unknown	2	11	1	5	.....	4	1	5	.....	1	.....	3
Total	1,357	1,242	348	973	141	375	60	135	178	181	245	716

[1] Incomplete records for Baltimore during September, October, December, January, and February.

A large part of the southern shipments are distributed in the North Central States. Competition from the northeastern section is not so keen as in eastern markets, and States that are advantageously located, like Tennessee, distribute the bulk of their shipments in this territory. Distribution is being rapidly extended west of the Mississippi River, an increasing number of cars going each year into the Middle West, Southwest, and Northwest. The demand for sweet potatoes is increasing in the larger western markets and new markets are being discovered and developed in some of the smaller cities.

Distribution within the producing States is also increasing. Some of the large shippers of cured stock distributed approximately 40 per cent of their shipments in southern cities. During the 1920–21 season one distributing agency delivered cars in 60 markets in 28 States, some of which had never before received sweet potatoes in car lots. The scattered producing area, the geographical position of the shipping States, competition, abundant supplies, and market preferences are a few of the factors that affect distribution.

GRADING.

IMPORTANCE OF GRADING.

Advantages which result from proper grading can not be overemphasized, especially in view of the competition that exists on the principal markets of the North and East. Grades provide a definite basis for sales, and their use facilitates the making of contracts for future delivery, sales by wire to distant buyers, the inspection of the product at shipping points and receiving markets, cooperative pooling, financing through advances on storage and warehouse receipts, and the intelligent comparison of market prices.

If southern shippers expect to compete successfully with shippers of attractively packed, uniform, carefully graded varieties of the Jersey group it is necessary that their product be graded as well. Much of the discrimination against southern varieties in northern and eastern cities can be overcome by proper grading at the shipping points. One reason for this discrimination is that southern shippers have established reputations for poor quality.

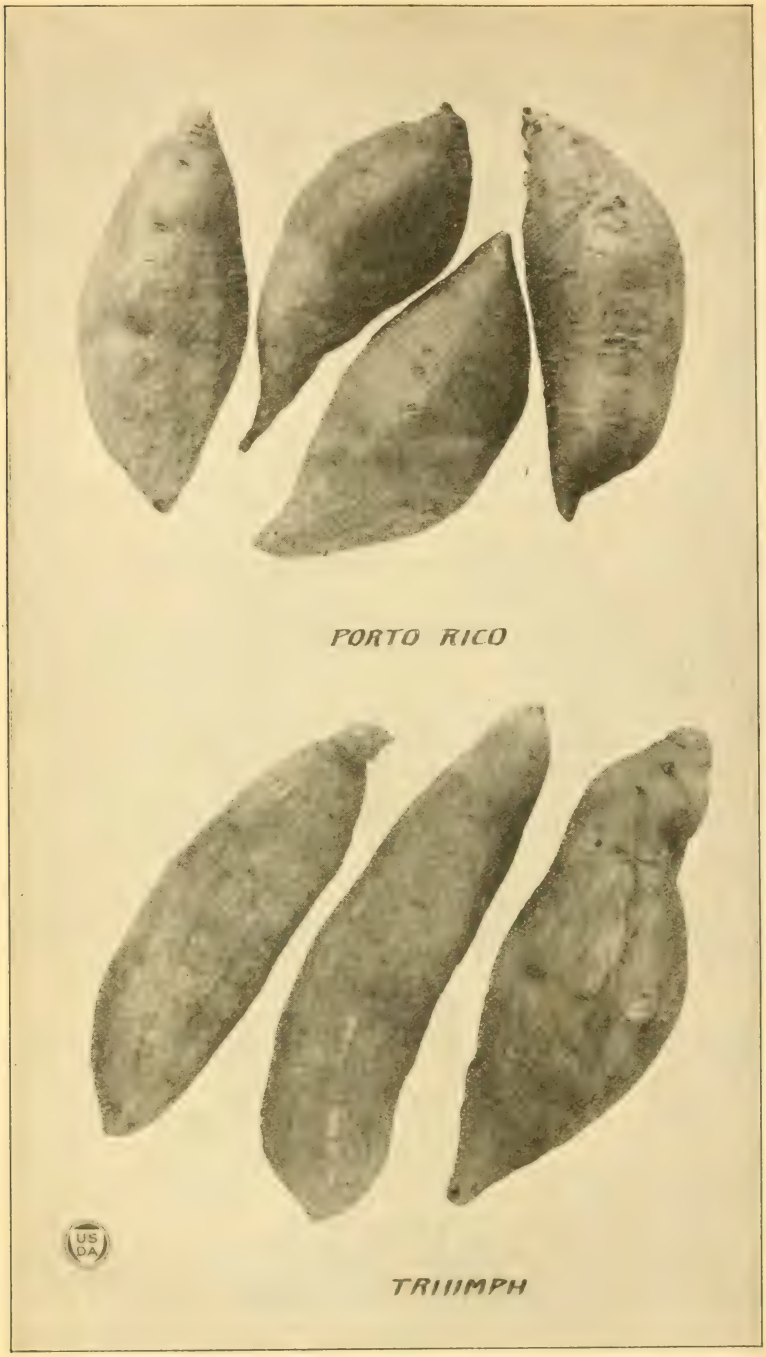

FIG. 4.—Desirable market types of the Porto Rico and Triumph varieties of sweet potatoes.

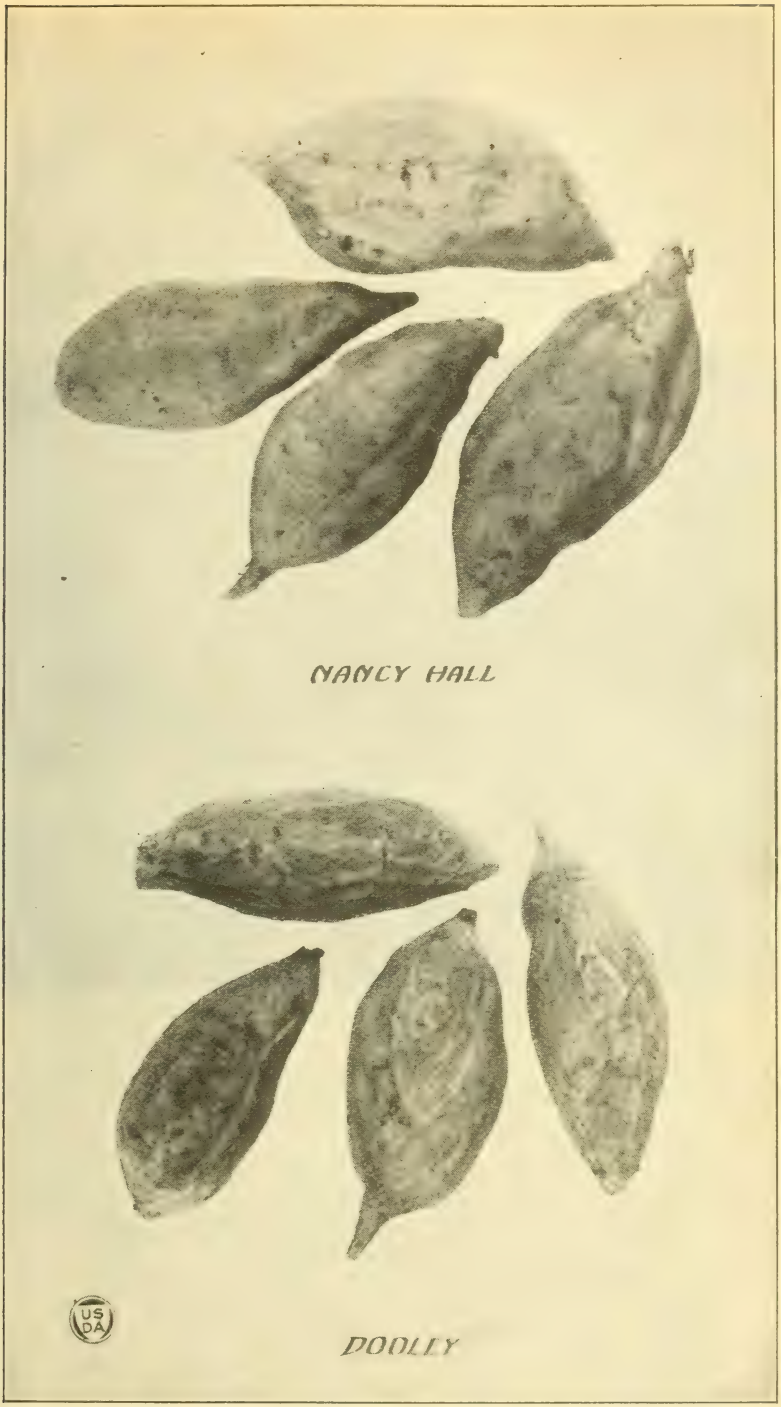

FIG. 5.—Desirable market types of the Nancy Hall and Dooley varieties of sweet potatoes.

Buyers do not want poor quality, even at lower prices. They prefer to handle the better standardized product of the northeastern producing States and are willing, in many instances, to pay twice as much for it. The degree of standardization attained in these States is, to a considerable extent, responsible for the demand for their varieties, for their successful distribution, large amount of f. o. b. selling, and comparatively high prices. The possiblity of competition from the South is one reason given in New Jersey for the improvement in grading and packing which occurred a few years ago.

At the present time most shipments of southern varieties are sold on the basis of the United States grades. In many instances, however, the shipments barely meet the minimum-grade requirements.

FIG. 6.—U. S. grade No. 1 sweet potatoes. Properly graded sweet potatoes are uniform in size, shape, and color.

Although conformity to grade requirements will facilitate marketing by wire sales to distant markets, shippers should not be satisfied to conform to minimum requirements. As a rule they should ship to distant markets only U. S. No. 1 stock which has been carefully handled, and selected for uniformity in size, shape, and color.

The moist, sugary varieties shipped from the South are not so attractive in appearance as the more uniform Jersey group varieties, and to obtain uniformity in size it is necessary to sort out many irregular, odd-shaped potatoes which otherwise conform to grade specifications. Extremes in size should be avoided. The U. S. grades were developed for all varieties and all sections and they necessarily permit considerable variation. Desirable market types, as shown in Figures 4 and 5, should be selected. The variation in size and shape in any one package should not be greater than is shown in Figure 6.

UNITED STATES GRADES.

Tentative grades for sweet potatoes were proposed by the United States Department of Agriculture in April, 1918. Two years later a few changes were made and the grades, as revised and recommended, were published in May, 1920, in Department Circular 99. The following extract gives the specifications for U. S. Grade No. 1:

U. S. Grade No. 1 shall consist of sound sweet potatoes of similar varietal characteristics which are practically free from dirt or other foreign matter, frost injury, decay, bruises, cuts, scars, cracks, and damage caused by heat, disease, insects (including weevils), or mechanical or other means.

The diameter of each sweet potato shall not be less than one and three-quarter inches nor more than three and one-half inches, and the length shall not be less than four inches nor more than ten inches, but the length may be less than four inches if the diameter is two and one-quarter inches or more.

In order to allow for variations incident to commercial grading and handling, five per cent by weight, of any lot may not meet the requirements as to diameter and length, and, in addition, six per cent, by weight, may be below the remaining requirements of the grade.

Any lot in which the diameter is not less than one and one-half inches and which contains a greater percentage by weight of sweet potatoes below one and three-quarters inches than is permitted in U. S. Grade No. 1, but which otherwise meets the requirements of such grade shall be designated as U. S. Grade No. 1 Medium.

Any lot in which the length is not less than six inches nor more than twevle inches and which contains a greater percentage by weight of sweet potatoes above ten inches in length than is permitted in U. S. Grade No. 1, but which otherwise meets the requirements of such grade shall be designated as U. S. Grade No. 1 Long.

DEFINITION OF GRADE TERMS.

"Practically free" means that the appearance shall not be injured to an extent readily apparent upon casual examination of the lot, and that any damage from the causes mentioned can be removed without appreciable increase in waste over that which would occur if the sweet potatoes were perfect.

"Diameter" means the greatest dimension at right angles to any portion of a central line running through the sweet potato from stem end to root end.

"Free from serious damage" means that any damage from the causes mentioned can be removed without increase in waste of more than ten per cent by weight over that which would occur if the sweet potatoes were perfect.

FIELD GRADING.

It is a general practice throughout the South to grade sweet potatoes in the field at harvest time, both for immediate shipment and for storage. If the grower intends to store in a cooperative house or arranges to sell to a commercial-house operator he is usually furnished containers in which to deliver his crop. Under instructions from the storage-house manager he supervises the field grading, which consists of sorting out the bulk of the undersized and oversized roots, and those showing disease, cuts, bruises, cracks, and other easily detected damage. Those that remain are loosely placed in the containers and hauled to the storage house.

Field grading, as practiced, saves time and reduces the expense of handling at the storage house, but it is not sufficiently well done in most instances to eliminate the necessity for regrading. Storage-house operators find so much variation in the grading of individual growers that it is often necessary to refuse to accept their deliveries or to regrade as the potatoes go into the house.

GRADING PRACTICES AND DEVICES.

Grading at the storage house is often done by negro laborers, who are paid by the hour or day. Portable grading tables are constructed by building frames of convenient height and fastening burlap over the tops. As the potatoes are delivered the containers are emptied on these burlap-topped tables, and the several graders sort out and pack for storage those that conform to grade requirements. Those that remain are dumped into containers and returned to the grower.

It facilitates the work of the graders to nail boards to one side of the grading table in such a way that a platform is provided on which to place empty containers. The platform should be high enough for the top of the container to be level with the top of the grading table. The

graders can then grade from the table to the container, picking up the potatoes with one hand and placing them in the container with the other, without changing their positions. A few houses use, instead of tables, a device which is called a belt conveyor or grading belt. It is a slowly moving belt that carries the potatoes in front of the graders in such a way that defects are easily detected and careful handling is forced.

It is advisable for one man to assume responsibility for the grading. Too many supervisors prevent uniformity in the grade and cause confusion among the graders. With suitable grading facilities and proper supervision it should be possible to reduce the number of laborers that are usually employed. The amount of instructions and supervision given to the graders depends on their experience. Much of the work is done by inexperienced negro women, who require close supervision.

Even the best graders should be instructed to verify their sizing occasionally by actual measurements. This may be done by providing each grader with two iron or steel rings, one $1\frac{3}{4}$ inches in diameter and the other $3\frac{1}{2}$ inches. A less durable but satisfactory sizing device may be made from heavy cardboard. It should be 4 inches wide and 10 inches long with two circular holes cut in it $1\frac{3}{4}$ inches and $3\frac{1}{2}$ inches in diameter. The width and the length of the card are the minimum and maximum lengths specified in the U. S. Grade No. 1, and the diameters of the two holes, through which the potatoes may be passed, are the minimum and maximum diameters permitted in the grade. Devices like these should be used by graders until their eyes become accustomed to sizing. After that they should be used occasionally as a check.

Graders should be instructed to sort out potatoes that show decay, bruises, cuts, scars, cracks, and damage caused by heat, disease, insects, or mechanical means. Those that are irregular in shape and those showing considerable soil stain or scurf should be culled out. Any excess of dry dirt should be rubbed off. "Rat-tails," as they are called, should be broken off.

Containers should be examined from time to time to determine if the percentage of off sizes and damaged potatoes is within the tolerances permitted in the grades. Different varieties should not be placed in the same container; in fact, they should not be stacked in the same section of the house. Containers should not be packed closely for storing and should not be heaped. Container lids or covers should not be used until after the potatoes are repacked for shipment. Care should be exercised to prevent bruising. After storing, the potatoes should not be handled again until they are removed for shipment.

REGRADING AFTER STORING.

The amount of regrading necessary at shipping time depends upon the thoroughness of the grading prior to storing. Regardless of how well they were graded they should be examined and any potatoes showing decay or shriveling should be thrown out. Sprouts over an eighth of an inch long should be removed. If the potatoes are in good condition, well-graded, and if they are to be shipped in storage containers, it is not necessary to dump them. The container may be partially emptied, the damaged or diseased potatoes removed, and those from another container used in refilling it. Better packing results, however, from removing all of the potatoes, either from one

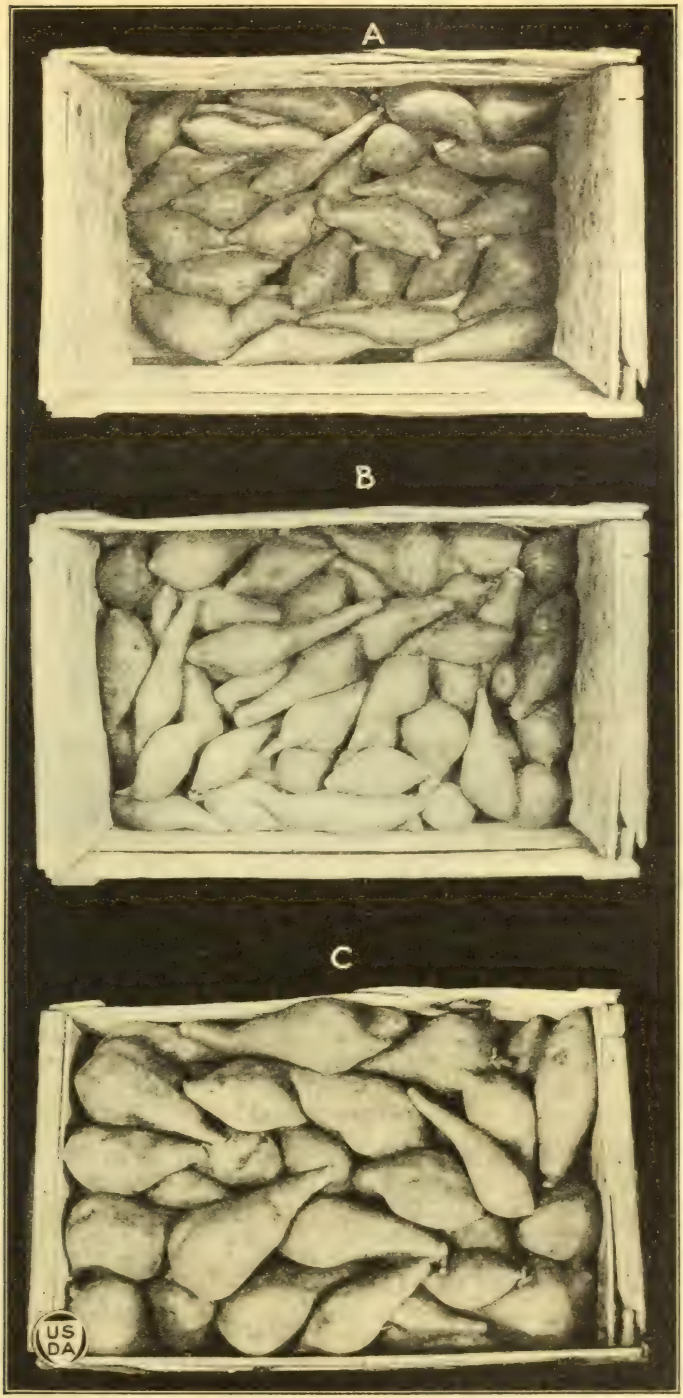

FIG. 7.—Proper packing. *A*. The longest diameters of the potatoes are parallel to the sides of the crate. *B*. Succeeding layers are arranged so that vacant spaces are filled. *C*. The filled crate. Compact packing prevents bruising, breakage, and pleases buyers.

container to another or by carefully dumping on the burlap-topped grading tables. The graders and packers should wear cotton gloves and should be careful to prevent bruising. Injuries to cured stock are dangerous, as they do not heal like those made at harvest time. Rapid decay follows bruising and scratching and often results in a substantial loss.

PACKING.

Inexperienced shippers who have not observed the condition of carlot arrivals in receiving markets fail to appreciate the importance of careful packing at the shipping point. A slack pack is one of the distinguishing characteristics of southern sweet-potato shipments. The constant jolting of a long freight haul causes considerable settling, and containers that appear to be full when loaded often arrive at destination only partially full. Loose packing not only causes damage to both the containers and their contents but also discourages buying. No one wants to buy at full-bushel prices a bushel package only three-fourths full. With well-filled containers on display from competing sections, wholesale dealers are forced either to repack or to offer partially filled packages at lower prices.

PACKING METHODS.

The irregular shape of the sweet potato, especially southern varieties, makes it a difficult product to pack. Jumble packing is almost certain to result in a slack pack on arrival in consuming markets, and should not be practiced. To carry properly, to arrive full, and to impress buyers favorably, each potato should be handled and placed in proper position in the package. Figure 7 illustrates an approved method of packing a crate. Each potato is placed in the crate with its longest diameter, as far as possible, parallel to the sides of the crate. Each layer is arranged so that vacant spaces are filled and settling thereby prevented. The same care should be exercised in packing hampers and baskets.

In filling barrels a small basket may be used to lower and empty half-bushel lots into the barrel without bruising. As each lot of potatoes is emptied settling should be forced by rocking the barrel back and forth with a jerky movement. This process is known as "racking." If burlap covers are used, they should be placed over the second top hoop and the top hoop should be forced down over the burlap so that its edges are confined between the two hoops. If wooden tops are used, the barrels should be headed with a screw press.

THE BULGE PACK.

A bulged package is popular with the buying public and often helps to develop a demand for the product of a certain locality or a certain shipper. The lidded crate in Figure 8 illustrates bulged packing. The depth of the pack is greater in the center than at the ends, so that the lid is bulged when it is nailed down. Packers sometimes obtain a bulge on the bottom by inserting a piece of 2 by 4 under the end of the crate farthest from them. By thus elevating one end they force a bulge. The amount of bulge on a crate should be about 1 to 1½ inches. A packed basket should be moderately rounding. The bulge should not be higher than 1½ inches above the rim of the basket at the center and not over three-fourths of an inch at

the sides. Very little bulge is possible in properly constructed hampers. Cloth or burlap topped barrels should be packed with a moderately rounding bulge approximately 1½ inches high at the center.

FACING.

An orderly arrangement of the sweet potatoes in topping a package adds to its attractiveness and is not considered an objectionable practice by the trade if the top layer is truly representative of the quality throughout the package. In facing crates an effort should be made to place most of the potatoes with their longest diameter parallel to the sides of the crate. In hampers, round-stave baskets, and barrels most of the potatoes should be at right angles to the rim of the package. Systematic facing is not possible to the extent that it is practiced with more uniform products, like apples, and the main purpose of the packer should be to make the top of the package smooth and compact, so that in addition to improving appearance the pressure of the lid or head will be evenly distributed to reduce bruising.

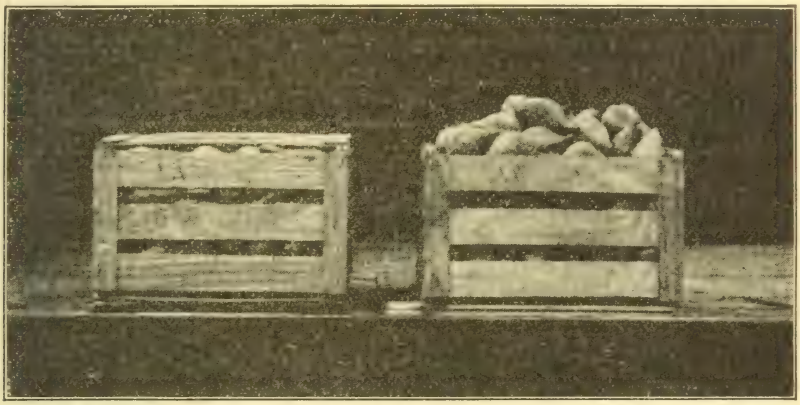

FIG. 8.—The same quantity of sweet potatoes tightly and loosely packed. Note the bulge on the lidded crate.

MARKING PACKAGES.

The net-weight amendment to section 8 of the Federal food and drugs act provides that food in package form shall be deemed to be misbranded unless the quantity of the contents is plainly and conspicuously marked on the outside of the package in terms of weight, measure, or numerical count. Sweet potatoes, shipped in interstate or foreign commerce, or offered for sale in the District of Columbia or Territories of the United States, are subject to the provision of this act if they are in package form. The usual method of showing quantity, as required by this act, is to stencil or stamp the package with the words "Net contents one bushel," or whatever represents the quantity of the contents of the package. Requests for interpretations of this act and for any additional information regarding it should be addressed to the Bureau of Chemistry, Department of Agriculture, Washington, D. C.

In addition to marking the quantity on a package as required by law, the quality should be shown. If the potatoes have been graded according to the recommended United States grades, a stencil or rub-

ber stamp may be used to mark the grade on the package. Ordinarily the statement merely names the grade, as "U. S. No. 1." Proper marking of containers creates a good impression and facilitates the handling and sale of a product in receiving markets.

CONTAINERS.

In selecting containers for shipping sweet potatoes the principal factors to consider are cost, carrying quality, ventilation, appearance, and market preferences. The relatively low price at which sweet potatoes are sold prohibits the general use of very small or very expensive packages. It is false economy, however, to attempt to reduce container cost by accepting poorly constructed containers or by using secondhand or homemade packages. Secondhand containers are often dirty and damaged, and homemade packages are not only unattractive but are seldom standard in size. The use of containers that are poorly constructed, heavy, warped, dirty, or misshapened means waste or damage in transit and results in lower prices for the product.

The buying public has learned to look for a standard product in a standard package, and the quality of the product is often judged by the outside appearance of the container. New containers should be purchased in car lots from reliable manufacturers, and should be standard in both size and construction. Too many sizes, with variations barely distinguishable at a glance, are deceptive and lead to misunderstandings.

Bushel packages having a fixed capacity in terms of dry measure are coming into general use in the Southern States. It is neither feasible nor desirable to attempt to standardize a sweet-potato container on the basis of a weight bushel, and efforts to do so in several producing States have resulted only in confusion. Not only does the legal weight of a bushel of sweet potatoes vary in the different States from 46 to 60 pounds, but there is a difference in the weight of green and cured stock.

Another factor that has contributed to the lack of uniformity in shipping containers has been the desire to develop a package suitable for all purposes; that is, field handling, storing, curing, loading, and merchandising. None of the packages tried have proven to be ideal for all purposes and all markets. Although some shippers state that it would be too expensive to use different containers for storing and shipping, there are other shippers who prefer to use lug boxes in the field and storage house and pack for shipment in new containers. Until a decided improvement occurs in field handling and storage-house practices, it is doubtful if sufficient economy results from the use of an all-purpose package to offset the advantages gained in packing for shipment in new standard containers.

MARKET PREFERENCES.

Use of containers that are popular with the fruit and vegetable trade facilitates the sale of a product on the markets. If the trade is accustomed to handling sweet potatoes in a container of a certain type and size, a different package that has no particularly advantageous features is difficult to introduce. Table 1 indicates the market preferences in the several sections of the country. According to reports from 76 representative dealers in the East, the barrel is the most popular container, the hamper a close second, the bushel crate third, the bushel basket fourth, and the 5-peck crate fifth.

In the Central group of States—Kentucky, Ohio, Illinois, Wisconsin, and Michigan—based on reports from 87 dealers, the hamper is by far the most popular, the barrel next, and no choice is indicated between the bushel crate and bushel basket for third place.

In the West there is about an equal demand for bushel hampers and bushel baskets, according to the reports of 79 dealers. The bushel crate and the barrel are next in order of preference.

In the South, based on 37 reports, the markets prefer sweet potatoes in sacks and in bulk. The crate is also popular, with barrels next, hampers next, and baskets next.

It is not difficult to account for the preferences indicated. For many years eastern cities have been supplied with sweet potatoes from the northeastern section in barrels and hampers. Tennessee and sections in adjoining States have been using the hamper almost exclusively for shipments into the North Central States. In the West preferences are not so well established. In the South trade preferences clearly reflect the old methods used by southern shippers.

CRATES.

The standard bushel crate shown in Figure 9 is 12 by 12 by 15 inches, inside measurements, and has a capacity of 2,160 cubic inches. It is used to some extent in practically every southern State. The folding crate shown in the same figure is $10\frac{1}{2}$ by $10\frac{1}{4}$ by $20\frac{1}{2}$ inches, and also holds a volume bushel. Objections to the proportions and unattractive appearance of the 12 by 12 by 15 inch crate resulted in the adoption of the other style of crate by a number of Arkansas shippers who used it to a considerable extent during the 1921–22 season. Its proportions approach those of the onion crate and the apple box, with which the trade are familiar, and many dealers have favorably commented upon it. A 5-peck crate, 12 by 12 by $18\frac{3}{4}$, containing 2,700 cubic inches, is widely used in South Carolina and Georgia. It is similar to the 12 by 12 by 15 crate except that it is $3\frac{3}{4}$ inches longer. While the additional length adds to its attractiveness, its odd size is a disadvantage. It is decidedly unpopular with the trade.

Crates are not used by the large shippers in the northeastern section. They came into use in the South with the development of commercial storage houses and the practice of storing in packages rather than in bins. In most sections where they are popular they are used for field handling, storing, curing, and shipping. Unfortunately many shippers do not demand quality, with the result that much of the objection to crates in certain markets is due to poor construction rather than to type. Frail, warped, clumsy crates arriving in the markets to be sold in competition with clean, strong, standard packages from other sections make an unfavorable impression and affect the dealers' distribution. In those markets in which prejudice exists it can be largely overcome by using only those crates that are recognized as standard in both capacity and construction.

HAMPERS.

In Tennessee, hampers have been used almost exclusively for all shipments, but in other southern States they are used mainly in shipping green stock for the early market. Comparatively few of the large storage houses market cured stock in this container. A preju-

dice against hampers exists for much the same reason that crates are viewed with suspicion in some markets; that is, in the past poor quality, careless packing, and improper loading have caused serious damage and loss. Hampers are widely used, however, by shippers in the northeastern section, and well-graded stock shipped from this section in bushel hampers almost invariably tops the market. They are popular packages with the trade in nearly all markets and are used for shipping many vegetable crops.

The particular type of hamper which should be used for sweet potatoes is shown in Figure 9. It should have not less than 8 staves, each of which should be not less than one-eighth of an inch thick and 20 inches long. It should have four hoops and should hold a volume bushel. Hampers of this kind are ordinarily referred to as standard 32-quart four-hoop hampers. Smaller sizes, which might be mistaken for bushel hampers, should not be used.

BASKETS.

The round-stave bushel basket as a container for sweet potatoes is a comparatively new package. It is not so widely used in the South as the crate or the hamper but seems to be growing in popularity, especially in the more western of the producing States. It is also a popular package in the markets west of the Mississippi River. The type of basket generally used is shown in Figure 9. The diameter of the top should be 17 inches and the depth should be not less than 10½ inches. It should have 20 staves not less than 2⅛ inches wide and one-eighteenth inch thick and of such length that they form the sides and bottom of a basket with a capacity of 32 quarts dry measure.

BARRELS.

Three styles of barrels are used in shipping sweet potatoes, each of which must have a capacity of 7,056 cubic inches, 105 quarts struck measure, in order to conform to the requirements of the Federal standard barrel act. In the northeastern section barrels are the most popular containers and all of the three styles are used—stave barrels, open-stave barrels, and veneer barrels. In some districts in this section veneer and open-stave barrels with burlap covers are used in shipping green stock direct from the field. Doubled-headed stave barrels, illustrated in Figure 9, are often substituted during the winter months.

In the southern section little use has been made of barrels except in a few districts that ship green stock early in the season. Stave and open-stave barrels with burlap covers are commonly used. Figure 10 shows burlap-topped stave barrels loaded on ends, and also illustrates how some shippers chop holes in the staves to permit ventilation.

SACKS AND BULK SHIPMENTS.

The Gulf Coast States are the largest users of sacks as shipping containers, and its cities are the principal receivers of sacked shipments. The 90-pound bag is the most popular size. Sacks furnish little protection and the potatoes become bruised and skinned in handling for shipment. Decay follows and in a comparatively short time disease spreads throughout the entire load. The damage and

FIG. 9.—Popular types of sweet-potato containers. Left to right: Bushel crate (12 by 12 by 15 inches), folding bushel crate (10½ by 10¼ by 20½ inches), standard double-headed stave barrel, standard bushel hamper, and standard round-stave bushel basket.

loss that accompany the use of sacks are gradually causing them to be discarded. They should not be used. If bushel containers are not desired, barrels may be substituted.

The practice of shipping in bulk is even more objectionable, although bulk shipments are ordinarily confined to poorly graded or field-run stock shipped to certain southern cities at digging time. Under no circumstances should shipments be made in bulk to distant markets or to markets outside of the South.

LOADING AND SHIPPING METHODS.

ORDERING CARS.

Requests for cars should be made several days before the shipper intends to load. They should be in writing, addressed to the local railroad agent, and should specify the type of car wanted and the date it is desired. Refrigerator cars should be ordered in cold

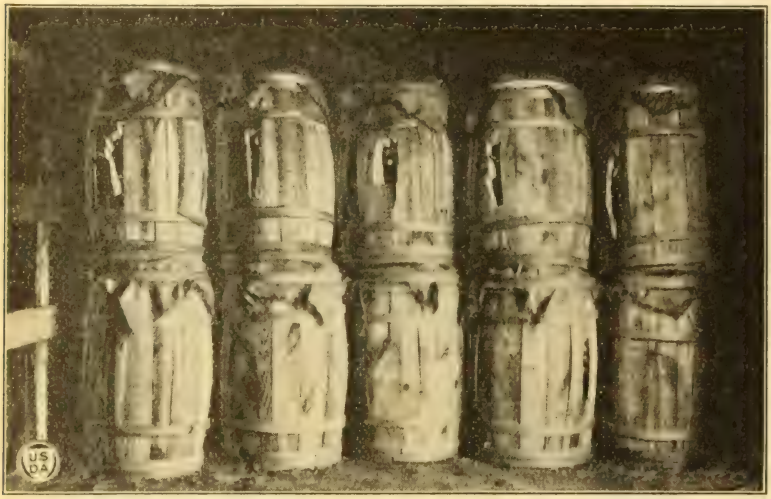

FIG. 10.—Burlap-topped barrels, loaded on ends, with holes chopped in the staves to provide ventilation.

weather. Some shippers use refrigerators throughout the season, but in the early fall and late spring, when there is no danger of freezing in transit, ventilated box cars are usually requested. During the harvest season and after March 15 most shipments from the South are made in ventilators. A request for equipment may be made in a form similar to the following:

PARIS, TENN., *March 10, 1923.*

Agent L. & N. Railroad:

Please place one refrigerator car at my warehouse by 9 a. m. March 13, for loading with sweet potatoes. The car must not have ice in bunkers, and the doors and hatches should be in good condition.

Yours truly, JOHN DOE.

After a car is placed for loading it should be examined to see if it is dry, if the doors and hatches fit tightly, and if it is in good condition otherwise. If it is not in good condition it should be either refused or used under protest. When it is necessary to accept a car which,

in the shipper's opinion, is not suitable, a protest in a form similar to the following should be addressed to the agent:

You are advised that car L. & N. 46753, placed by you for loading with sweet potatoes in accordance with my request of March 10 is not suitable on account of a broken door and leaky roof. Notice is hereby given that this car is loaded under protest.

Orders for cars and notices of protest should be written in duplicate, the shipper retaining copies for possible use in establishing claims for damage or loss in transit. Accepted cars should be loaded promptly.

DEMURRAGE.

Under existing regulations shippers are allowed 48 hours in which to load, after which a demurrage charge is made for each day or fraction of a day until the car is released. The free time is computed from the first 7 a. m. after placement on public delivery tracks without notice to the shipper. However, if a car is not placed within 24 hours after 7 a. m. of the day for which it is ordered, free time is computed from 7 a. m. after the day on which notice of placement is sent or given to the shipper. On cars held for reconsignment, diversion, or reshipment, or held in transit on the order of the consignor, consignee, or owner, 24 hours free time is allowed.

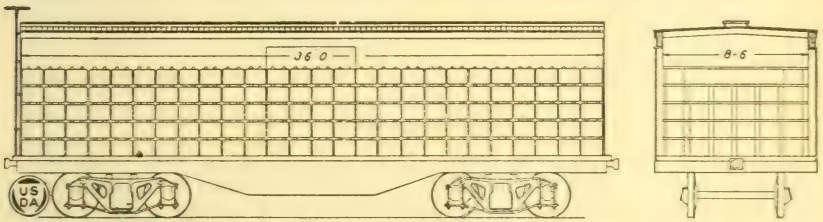

FIG. 11.—Method of loading bushel crates (12 by 12 by 15 inches) in a 36-foot car. Main load should not be more than four layers high, but additional crates may be loaded, if necessary, as shown in the end view.

LOADING CRATES.

Standard bushel crates (12 by 12 by 15) should be loaded as shown in Figure 11. The height of the main load should be four layers, as shown in the end view of the figure.

A "layer" is a course or stratum of the load in a car, one package in height; a "stack" is a pile of packages extending from one side of the car to the other, one package in length; and a "row" is a pile of packages extending lengthwise of the car one package in width.

The first layer should be loaded with the tops up, and the crates should extend from end to end of the car, filling the floor space. Each cross layer should be stripped, the strips being not less than one-half inch thick and 1 inch wide. One end of each strip should rest against the side of the car, alternating from one side to the other with each strip. The strips should be nailed to the front and back of the top of each crate. Other layers should be loaded and stripped in the same manner.

If it is necessary to load additional crates, they should be placed lengthwise, as illustrated, on top of the last layer, braced with strips, and arranged so that they will not obstruct ventilation. When the floor space is not completely filled, the load should be braced according to the method described on page 29. This plan of loading should be followed as closely as possible when crates of other dimensions are used. The number of crates loaded in a car usually ranges from 500 to 600.

LOADING HAMPERS.

Hampers should not be loaded more than three high, as illustrated in Figure 12. The first layer should be loaded on ends, reversed, and should extend from end to end of the car, filling the floor space. Other layers should be loaded in the same manner, tops against tops and bottoms against bottoms. If there are not enough hampers in the top layer to fill the entire space, all the top layer should be loaded on the side, with ends reversed, or enough of them should be loaded on the side to form a brace for those standing on ends. Bracing with strips is not necessary, but when the floor space is not completely filled the load should be braced in the center as described on page 129. The number of hampers loaded in a car by southern shippers ranges from 500 to 700, the usual load being about 600. In the northeastern section the number loaded ranges from 300 to 380.

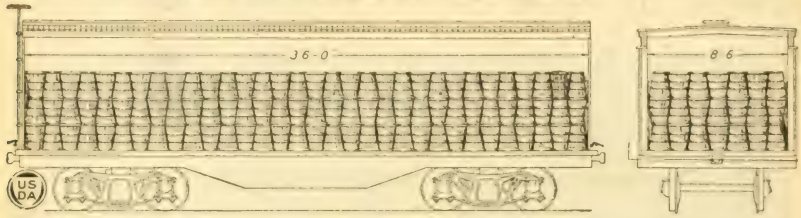

FIG. 12.—Method of loading bushel hampers in a 36-foot car. Tops are against tops and bottoms against bottoms.

LOADING BASKETS.

The plan of loading round-stave bushel baskets, which is shown in Figure 13, is known as the five-five offset method and is recommended for cars that exceed 8 feet 4 inches in width. The first basket should be placed snugly in one corner of the car and the layer of five should be so arranged that the fifth basket is within 9 inches of the other side of the car. The next layer in the stack should start from the opposite side of the car offsetting the fifth basket in the bottom layer. (By offsetting is meant that baskets in an upper layer rest on the edges of two baskets in a lower layer.) The stack should be built to its full height, three or four baskets high; tops should be up; and handles should be in the same relative positions.

Each succeeding stack should be loaded by placing baskets against one side of the car and then against the opposite side, as illustrated in the floor plan. Loading should be from the ends toward the doorway, and when the floor space is not completely filled the load should be braced as described on page 29. Any additional baskets should be placed in rows along one side of the car with covers up, handles lengthwise of the car, and a rope passed through the handles from end to end of the car. The number of baskets loaded ranges from 330 to 500.

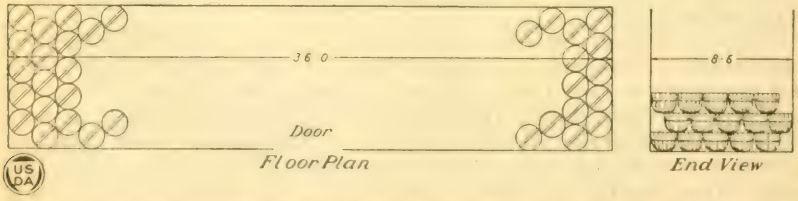

FIG. 13.—Floor and diagrams showing the five-five offset method of loading round stave baskets. This method is recommended for cars which exceed 8 feet 4 inches in width.

LOADING BARRELS.

Figure 14 shows the method of loading barrels on end, two layers high. This method should be followed whenever cloth or burlap is used instead of wooden heads. If there are not enough barrels in the second layer to fill the entire space, enough of the barrels should be loaded lengthwise on bilge to act as a brace to those loaded upright. Doorways should be braced as shown in Figure 16. If the floor space is not completely filled, a center brace, described below, should be used. While the number of barrels loaded in a car ranges from 150 to 240, the usual load is between 160 and 200. It is not advisable to load more than two layers high.

A satisfactory method of loading double-headed barrels on bilge is known as the "alternating straight" method. Two rows of three barrels each, end to end, are placed across the car. This leaves a space of about half the length of a barrel between the end of the rows and one side of the car. The second layer is then started by placing one row of three barrels on top of the first two rows, but starting from the opposite side of the car and covering the open space between that side of the car and the ends of the lower rows. This plan is continued, alternate layers being started from opposite sides of the car. One advantage of this method is that the bilge of one barrel does not rest directly upon the bilge of another.

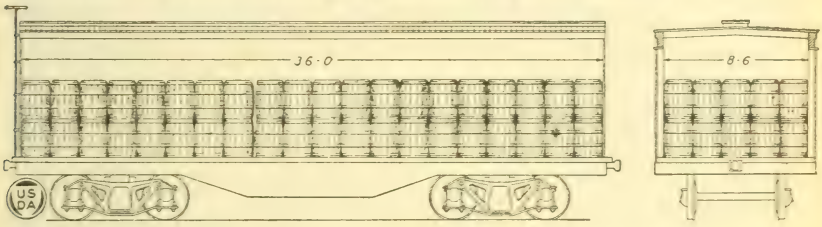

FIG. 14.—Method of loading barrels in a 36-foot car. This method is especially recommended for loading cloth-topped barrels.

CENTER BRACING.

To prevent damage in transit from the shifting of a load, tight stowing is necessary. When all the floor space is not completely filled, center bracing takes up the slack and gives the load stability. Two gates are made which are placed against the ends of the load with a space between them varying usually from 1 foot to the width of the car doors. (See fig. 15.) Uprights (*A* and *B*) should be of 2 by 4 or 1 by 4 material, and the horizontal strips (*C*) should not be less than 2 by 2 inches. The uprights should be in the center of each row of containers with the even surface toward the packages. Upright *A* should be as high as the load and upright *B* should extend to the top of the car to prevent buckling. Horizontal strips should extend the width of the car. After the two gates are in place braces made of 2 by 4 inch lumber are inserted between them at the bottom, center, and top. These braces are usually cut long and driven between the gates so that all slack is taken up. They are then toenailed to the horizontal strips. If the space to be taken up is only a few inches, wedges may be driven between the gates. It is a good idea for shippers to construct a number of gates before they begin shipping, rather than build them piece by piece within the car at loading time.

DOORWAY BRACING.

When cars are loaded solid—that is, without center bracing—it is advisable to use boards between the packages and the doors of the car. Refrigerator cars have swing doors, which make unnecessary any door bracing, but in ventilator or other cars having sliding doors, boards 1 by 6 inches should be placed across the inside of each doorway, one board for each layer of packages. This helps to prevent shifting of the load and damage to the containers when the door is opened for inspection or unloading. (See fig. 16.)

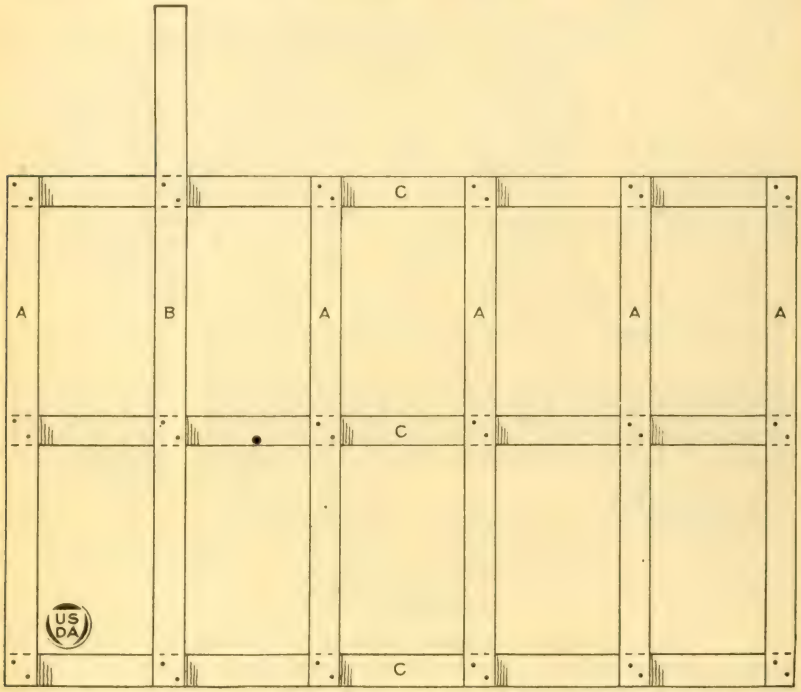

FIG. 15.—Gate for center bracing. Two gates are used, which are placed against the end of the load and held in place by braces.

FALSE FLOORS.

In winter the possibility of damage from cold is reduced by using slatted false floors or floor racks; in warm weather free circulation of air is facilitated; and at all times protection is afforded from any acids or oils which may be on the car floor. Many refrigerator cars are permanently equipped with false floors, some of them hinged to the car walls so that they may be raised when the car is cleaned. Ventilated box cars are not so equipped, and shippers have to provide false floors at their own expense. A false floor may be constructed by using 8 pieces of 2 by 4, each 14 feet long, and 42 pieces of 1 by 4, each 8 feet long. The 2 by 4 pieces should be used as stringers, 4 pieces in each end extending from the ends of the car to the doorway. The 1 by 4 pieces should be nailed across the stringers, extending from side to side of the car, and spaced 2 inches apart. The material specified is sufficient to construct the floor to the

doorway only; additional 2 by 4 pieces should be used to splice the stringers, connecting them across the door space. If the car is to be loaded solid, the floor should be completed by nailing 1 by 4 pieces across the connecting stringers.

HEATING AND VENTILATING CARS.

Subject to a few exceptions in certain territories, a heater car service is not available to southern sweet-potato shippers. Although they are permitted to furnish heat in transit, subject to conditions specified in the railroad tariffs, it is not done. It is a common practice, however, in extremely cold weather to place a stove in the car about 12 hours before it is to be loaded. An oil heater is suitable for the purpose, and may be kept burning during loading. The car should be loaded as quickly as possible and the doors closed.

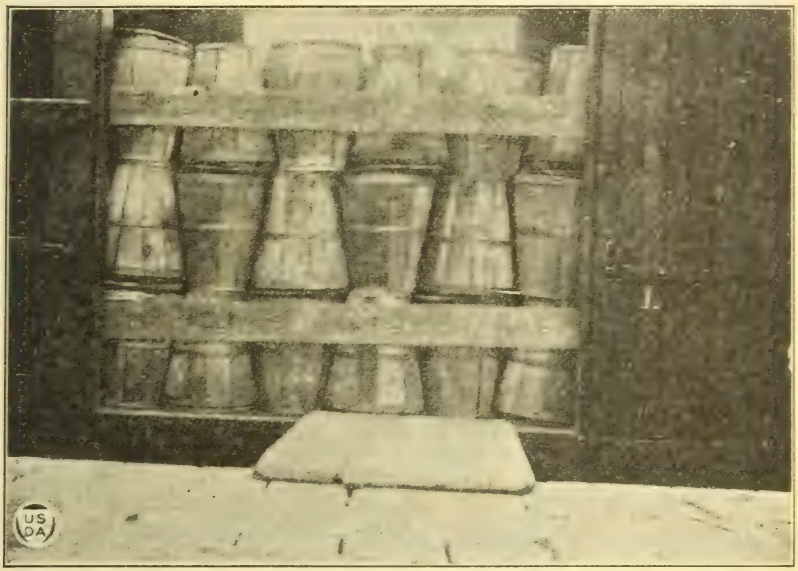

FIG. 16.—Doorway bracing. Three boards should have been used, one for each layer of hampers.

Many shippers make it a practice to leave the vents in refrigerator cars wide open when the temperature is 40° F., or above, decreasing the ventilation as the temperature drops between 40° and freezing, and closing all vents when the temperature reaches the freezing point. In warm weather ventilator cars are used with all vents open.

LINING CARS.

In cold weather cars are sometimes lined with building paper. A car 8 feet by 8 feet 6 inches by 36 feet requires approximately 2,250 square feet of paper to line throughout. Whether or not it should be completely papered, as shown in Figure 17, or only partially papered, depends upon the type of car and its condition. If it is necessary to use a ventilator car it should be papered throughout. Refrigerator cars are ordinarily papered only over the ends, the floor, and as high as the load on the sides. Two thicknesses of paper are often used on the ends and across the doors. All seams should lap at least

4 inches. On the walls and ceilings the paper should be held in place with laths or with one-half by 1 inch lumber, similar to that used in stripping crates.

LINING CONTAINERS.

It is a practice in some of the producing districts of the northeast to line containers with paper in cold weather. Figure 18 shows a hamper of sweet potatoes from Delaware that is lined in accordance with this practice. In New Jersey, barrels are often lined. A desirable feature of this practice is the protection given the sweet potatoes when they are removed from the car at destination under unfavorable weather conditions.

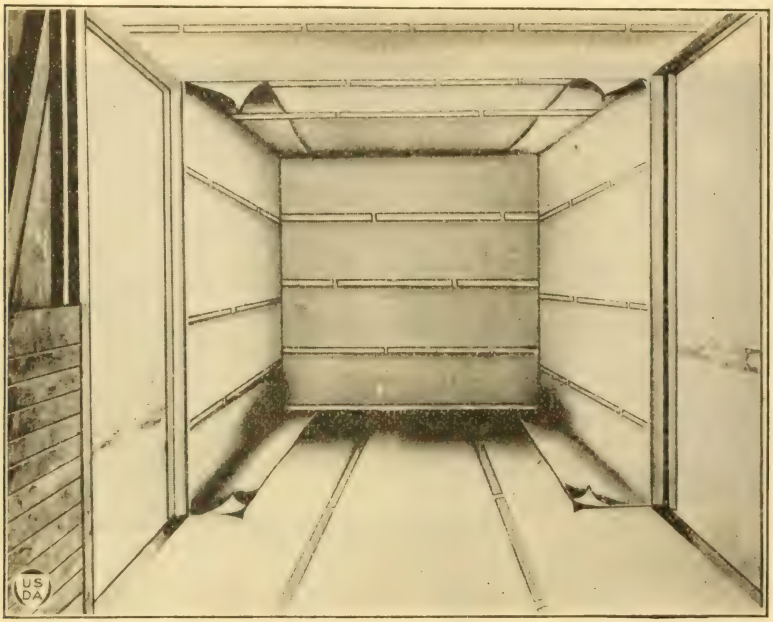

FIG. 17.—A box car completely lined with building paper. This is a method occasionally used to protect shipments in extremely cold weather.

WEIGHING.

Portable platform scales are commonly used in weighing sweet potatoes as they are loaded. The scales may be placed inside the storage house, on the platform, or in the car, and several packages may be weighed at the same time. A record should be kept showing the number of containers, the gross weight, and the net weight.

RAILROAD BILLING.

The number of packages, a word or words descriptive of the product, and the total weight of the shipment must be entered in the proper columns of the bill of lading. Underneath these entries the following notation should be made in warm weather, "All vents open." In cold weather this should be changed to read "Standard ventilation; protect from freezing." To avoid complications at destination, regardless of the terms of sale or the form of the bill of lading, it

should also bear the written notation, "Permit inspection." The shipper may bill a car to a commission man or buyer, to his broker or representative, to himself, or to himself "advise the consignee." A "straight" bill of lading should be used in all instances. Shippers should not make the mistake of using an "order notify" bill of lading in shipping sweet potatoes because a car can not be diverted or delivered to the buyer without surrendering the original bill of lading.

ROUTING CARS.

To effect economy and to facilitate the handling of shipments at destination, buyers frequently instruct shippers to route cars over

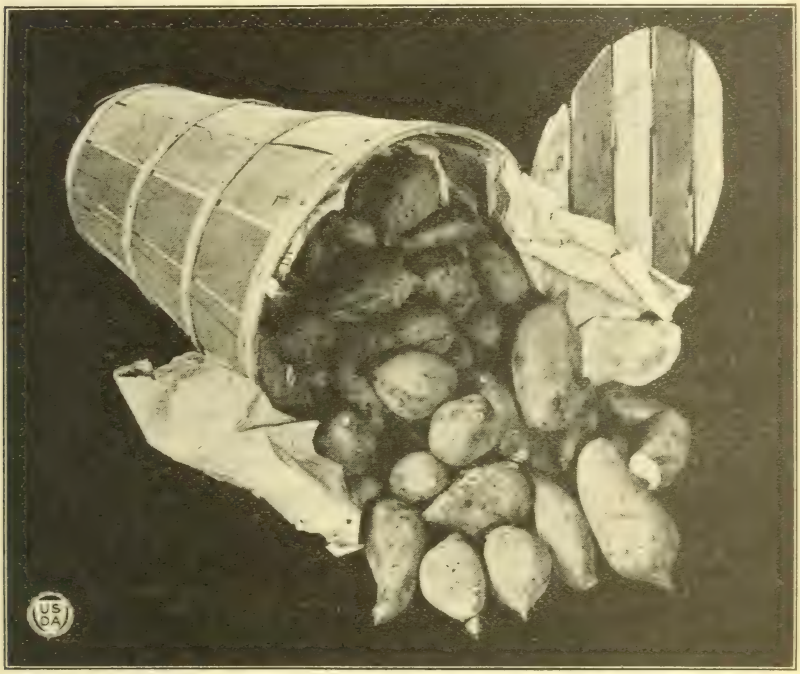

FIG. 18.—A bushel hamper lined with paper. The practice of lining containers in cold weather is more common in the northeastern section than in the South. Wrapping paper is generally used.

certain railroad lines. Failure to observe these instructions often results in substantial loss to both the buyer and shipper. In some cities shipments of produce can not be handled unless they are received over a certain railroad. In Pittsburgh, for example, the produce yards are located on the Pennsylvania tracks and shipments can not be handled if received over any other line. It is especially important, therefore, for the shipper to follow the buyer's instructions regarding the delivering line, and failure to do so is considered a valid reason for rejecting a shipment.

In the absence of instructions, shippers should be sure that the car is routed so that delivery will be made over a railroad that has yards convenient to the produce district. If the point of origin is on a trunk line, the routing may be safely left open as there is reasonable assurance that the car will move over the most direct route.

Small railroads, however, may send a car over a circuitous route unless given specific instructions by the shippers. An excessive number of transfers between connecting lines should be avoided.

DIVERTING CARS.

It is frequently necessary to divert a car in transit, or to reconsign it after arrival at a market. Diversion orders may be filed with the local agent, or may be wired to the general freight agent of the originating line, or, if the car is to be reconsigned, to the agent of the delivering line at the first destination. Some shippers prefer to wire the general freight agent of the road rather than depend upon the local office to transmit the order. A telegram ordering a diversion should contain the car initials and number, date of shipment, shipping point, destination, contents, and the names of the shipper and the consignee. There should follow the name of the city to which the car is to be diverted and the name of the new consignee. The following example indicates how the telegram may be worded.

GENERAL FREIGHT AGENT, MONTEZUMA, GA., *March 22, 1923.*
A. B. & A. Railroad, Atlanta, Ga.

From Montezuma twenty-first consigned ourselves Atlanta Car A. C. L. 30751 sweet potatoes. divert protecting through rate Jones & Smith Cincinnati route L. & N. Wire accomplishment.

BROWN & CO.

Diversion instructions given by telegraph, by telephone, or in person should be confirmed by a written order, a copy of which should be retained by the shipper. This confirming order should give clearly the essential facts of the request, and in addition should state the day and hour at which the original order was filed. The words "protect through rate" should be included to avoid the possibility of a freight charge made up of a combination of local rates.

OUTLETS AND METHODS OF SALE.

Success in selling sweet potatoes in car lots depends to a considerable extent on the shipper's knowledge of markets and market conditions. Shippers should visit the principal markets in which they expect to sell in order to establish contacts with dealers, and to learn the methods, practices, and preferences of the trade. They should see how sweet potatoes from competing sections are graded, packed, and sold. Following a visit to the markets they should keep in constant touch with market conditions through reports, price currents, newspapers, trade journals, and correspondence with their representatives or with reliable dealers with whom they have made connections.

During the active shipping season the telegraph and telephone should be the main medium of communication with dealers. All the information available relative to supply, current demand, car-lot movement, prevailing prices, competitive conditions, market preferences, and market limitations and possibilities should be used as a basis for determining when and where to sell.

Before market connections are established, a shipper should ascertain the reliability and financial rating of numerous dealers. If a personal investigation is not possible, information often can be obtained from State agricultural officials, or from such agencies as chambers of commerce and boards of trade. Local bankers can assist in determining the financial responsibility of particular firms or individuals in distant cities. Shippers may also obtain the names

and ratings of all the dealers in the United States by subscribing for the service of one of the commercial rating agencies which cover the produce trade. These agencies issue annual and supplementary reports and in some instances contract to collect claims, adjust differences, and render other services to shippers. The practice of consigning in response to the solicitations of unknown dealers should be avoided.

With the exception of a few sales to chain store companies, practically all car-lot shipments are sold through wholesale trade channels. Because of conditions which exist in the southern sweet-potato industry, such as the large producing area, the abundance of supplies, and the lack of uniformity in both the grade and the product, the outlets and methods of selling are more limited than is the case with certain other vegetable crops. Cash sales at shipping points to traveling buyers and brokers are almost unknown. The auction method, used only by shippers of highly standardized products, is not suitable for sweet potatoes at the present time. Car peddling, or sales made at the car door by the shipper to dealers and consumers, is not practiced. Sales on "joint account," which is an arrangement providing that the shipper and market representative divide expenses and profits, is uncommon. Sales "on track" at destination are usually made only in emergencies. The methods generally used are (1) shipments on consignment, and (2) wire sales.

CONSIGNMENTS.

The larger part of the southern shipments are consigned. While some of the distributors, cooperative associations, and experienced individual shippers often succeed in selling nearly all of their cars on an f. o. b. or "delivered" basis, the smaller shippers who have not established reputations for quality stock find it necessary to consign the bulk of their shipments to commission merchants. A commission merchant acts as the shipper's agent. He receives the car, sells it to the jobbing and retail trade for the best price obtainable, and remits the proceeds to the shipper after deducting his commission and any expenses incurred for drayage, storage, repacking, etc. Total charges usually range from 10 to 20 per cent of the gross selling price. An account sales is usually rendered to the shipper before collections are made from the buyers, often within 24 hours. Car-lot wholesalers, who ordinarily buy, sometimes handle shipments on a commission basis. This is especially true during a season of abundant supplies and low prices, such as the 1921–22 season. Shipments should not be consigned to car-lot wholesalers or brokers without a previous agreement, and consignments to commission merchants should not be made without advance notice.

WIRE SALES.

Outright sales to distant buyers may be made on an f. o. b. shipping point basis, or f. o. b. destination, before shipment; after the car has arrived at market, or while it is in transit. In each instance the price is agreed upon before the car is delivered. The "f. o. b. point of origin" sale is the most popular with shippers. The shipper loads the car with the buyer agreeing to pay a definite price for it on arrival, subject to inspection. The buyer pays the freight and assumes all risks of damage in transit not caused by the shipper. Sales "f. o. b destination," or "delivered" sales, as they are usually called by the

trade, mean that the shipper assumes the cost and risk of delivering the car to its destination. If the freight is not prepaid the purchaser deducts it from the price agreed upon. Sales of sweet potatoes "in transit" are uncommon as it is not a good practice to ship cars without having made prior arrangements for their disposition. The extent to which sales can be made by wire depends partly on market conditions and partly on the reputation, or lack of reputation, of the shipper. On a declining market buyers hesitate to purchase for future delivery, and when they do, rejections are frequent. At all times they hesitate to purchase "sight unseen" from shippers who have not established reputations for the quality of their brand or grade. Some shippers obtain as good results from their consignments as from their wire sales, but it is generally recognized that selling is preferable. Most shippers quote their offerings f. o. b. the shipping point.

SALES THROUGH BROKERS.

Ordinarily brokers do not receive shipments, but act as the representatives of shippers in negotiating sales to car-lot buyers. While brokers often render valuable assistance in preventing rejections, or in securing proper allowances where rejections are justified, it is not customary for them to make collections and remittances. After a broker arranges a sale the shipper usually deals direct with the buyer. The shipper names the price at which the broker is to sell or confirms an offer obtained by the broker. Brokers' charges are not based on selling prices but on the carload. The brokerage on sweet potatoes usually ranges from $15 to $25 a car. The practice of billing cars direct to brokers is uncommon, although it is occasionally done in accordance with a previous agreement. Cooperative associations and large distributors are often represented by brokers in the large markets.

SALES THROUGH DISTRIBUTORS.

Distributors are usually companies that undertake to distribute the car-lot shipments of both individual shippers and cooperative associations. They charge either a percentage or a fixed amount per car, usually the latter. Contracts are made between the distributor and the shipper. Inasmuch as these contracts vary, according to the conditions in each deal, it is difficult to determine an average charge. In general, distributors charge about the same as private brokers, plus the cost of any additional service they agree to render. In the larger markets, distributors usually sell through their salaried representatives or private brokers. Collections are made from buyers, adjustments are made, and claims are handled.

QUOTING PRICES.

In offering sweet potatoes for sale the shipper should state the probable date of shipment; the variety, grade, number of packages, kind of packages, and any other information necessary to describe the offering accurately. A telegram, which the shipper should prepay, may be worded like the following:

YEMASSEE, S. C., *March 10, 1923.*

JONES & SMITH, *Pittsburgh, Pa.:*

I offer subject to confirmation shipment to-day number one Porto Rico sweet potatoes in bushel crates dollar fifty fob here.

JOHN DOE.

If the buyer, Jones & Smith, makes a satisfactory offer, or if John Doe quotes the price and it is accepted, the shipper, John Doe, should wire immediately confirming the sale at the price named. If the car is loaded and ready for shipment the following form of telegram is suggested:

Shipped you to-day A. C. L. 36922 Pennsylvania delivery 540 crates number one Porto Ricos dollar fifty crate fob here.

The phrase "Subject to confirmation" should always be used, otherwise acceptance by the buyer results in a binding contract. In quoting f. o. b. offerings the trade understands that "point of origin" is meant unless otherwise specified. The shipper, however, should avoid a possible misunderstanding by specifying whether at "point of origin" or "destination." In either case, it is understood that the shipment is subject to inspection by the buyer. If it is below grade, or not as represented, it may be rejected and the shipper has no recourse.

In quoting "Shipment to-day" it is understood by the trade that the car offered is to be loaded and billed before midnight of the day the order is given. "Immediate shipment" permits a period 24 hours longer, and "Prompt shipment" 72 hours longer than "To-day." Offers of a carload are understood to mean that the weight, when loaded, will not be less than the minumum weight specified in the carrier's tariff, and not more than 20 per cent in excess of the minimum.

COLLECTIONS AND BILLINGS.

A large number of cars are sold on "open account;" that is, a car is billed direct to the buyer and an invoice is sent with the bill of lading. While this method has been satisfactory to many shippers, it should be used only when sales are made to a dealer whose integrity and financial responsibility are unquestioned. It is a method which can not be recommended for the average shipper. The best practice in f. o. b. selling is for the shipper to draw a sight draft on the buyer. This is the usual method of collecting. The draft may be sent direct to the bank named by the buyer or it may be deposited by the shipper in a local bank for collection. If deposited for collection the local bank sends it to its "correspondent" in the city named unless it bears a notation such as "Send to (name of buyer's bank)." If the shipper desires, he may request that the receiving bank wire him in the event the draft is not paid promptly.

To obtain payment before a shipment is delivered to a buyer, the shipper may bill the car to himself, "advise the consignee." This is a method used by many distributors and cooperative associations. A "straight" bill of lading is used, and the original is retained by the shipper. A draft is drawn on the buyer and an order is attached to it which directs the delivering railroad to deliver the car to the buyer without presentation of the bill of lading. This order should be written on the business letterhead of the shipper and should be in the following form:

YEMASSEE, S. C., *March 10, 1923.*

AGENT, PENNSYLVANIA R. R.,
Pittsburgh, Pa.

DEAR SIR: On payment of all charges please deliver without bill of lading car No A. C. L. 36922, containing 540 crates of sweet potatoes, to Jones & Smith.

Yours truly,

JOHN DOE.

On arrival of the car the buyer is advised by the railroad company, inspects the car to determine if it is satisfactory, pays the draft at the bank, and with the release notice given him by the bank obtains possession of the car. If the car is rejected, the shipper, who has the original bill of lading, can reconsign it, if he so desires, without loss of time. If he desires to deliver the car to another buyer following the rejection, a release order can be telegraphed to the agent of the delivering railroad. Should it be necessary to consign the car to a commission merchant in some other market, this can be handled by telegraph. The commission merchant should be advised at the same time. The wire to him should state the point from which the shipment is made and may be worded as follows:

Am to-day consigning to you from Pittsburgh via Pennsylvania car A.C. L. 36992 containing 540 crates number one Porto Rico sweet potatoes. Handle for my account.

BUSINESS METHODS AFFECT SALES.

Many marketing difficulties experienced by shippers result from their failure to observe trade practices and good business methods. Offerings of sweet potatoes usually exceed the demand and there is little incentive for a reliable buyer to continue business relations with a shipper who has proven to be careless or unreliable. A shipper who misrepresents his shipments or fails to describe them accurately, who fails to confirm offers, who never ships at the time specified, who fails to abide by his agreements, and who consistently neglects to observe trade customs and common business principles, finds it increasingly difficult to interest dealers. There are other southern shippers who seem to be obsessed by the "hold for higher prices" idea, and they never want to sell at the market price, regardless of how fair it may be. The attitude of many southern shippers and their methods of doing business are factors which partly account for the fact that the trade prefers to buy from shippers in the older commercially producing districts, who, in many instances, are trained salesmen with standardized methods, standardized products, and sales policies that facilitate business.

ADVERTISING.

COMMODITY ADVERTISING.

The benefits that have accrued to growers and shippers of certain farm products through national advertising campaigns have inspired plans for similarly advertising southern sweet potatoes. There is no doubt that a campaign of like magnitude would stimulate consumption in existing markets and create a demand in potential markets. However, the plans proposed for commodity advertising, which is advertising designed to benefit the entire industry rather than a particular individual or group, have not been feasible inasmuch as they presuppose an organized industry, which, in the case of sweet potatoes, does not exist.

Until organizations are perfected and in a position to control a large proportion of the shipments it is doubtful if an expensive campaign should be attempted. Such campaigns are directed primarily to the consumer and involve the use of display space in popular magazines and newspapers, billboards, street-car signs, electric signs, window displays, demonstrations, and sample distribution.

It is not only necessary to have organizations through which this can be financed by equitably distributing the cost in proportion to sales, but is also necessary to maintain a high standard of quality in the product.

Until there is a decided improvement in the handling, grading, packing, and shipping of southern sweet potatoes the wisdom of an expenditure of a large sum of money to advertise the product is questionable. However, there are comparatively inexpensive forms of advertising which should be employed, such as exhibits at fairs, the distribution of attractively prepared booklets of recipes, and the preparation and use of publicity material. Some shippers inclose in each package shipped a circular or booklet which describes the merits of moist-fleshed varieties and the superior keeping quality of kiln-dried stock. These usually contain recipes used by southern cooks. Considerable publicity has been made possible through the cooperation of such agencies and institutions as agricultural colleges, departments of agriculture, chambers of commerce, railroads, and fair associations.

BRAND ADVERTISING.

A number of large sweet-potato shippers, distributors, and cooperative marketing organizations have adopted brands and are advertising them to a limited extent. This advertising is mainly directed to the fruit and vegetable trade, and the mediums used are trade journals. Cooperative associations customarily deduct, or have the authority to deduct, a certain amount per package for advertising purposes, so that each member contributes according to the amount of business handled for his account. In a few cities street-car signs, newspapers, and other mediums have been used to advertise brands to the consumer, largely as an experiment. In one city in which several thousand dollars were spent in an intensive preholiday campaign it was demonstrated that the difficulties in marketing southern varieties are mainly in the producing section. While sales were made for future delivery at more than twice the current market price for southern stock, the campaign failed because the shippers did not deliver either the quantity or the quality sold.

A brand is a distinctive identifying mark, usually a design that contains an attractive, catchy name for the product and the name of the organization using it. Brand advertising indirectly benefits the entire industry, but is intended primarily to create or stimulate a demand for the product of a certain group or a particular sales agency. The appearance of a brand on a package is intended to indicate quality, and unless it is used in connection with a standardized product the purpose for which it is intended is defeated. The brand should be painted, stenciled, stamped, or gummed labels should be affixed, only on those packages which conform to the standard represented by it. A brand should be a guarantee of quality, a trade-mark, and should be registered for the protection of its owners. Information relative to registration may be obtained from the Commissioner of Patents, Patent Office, Washington, D. C.

COOPERATIVE MARKETING.

The development of cooperative marketing associations among sweet-potato growers should bring about improvement in growing, handling, grading, storing, and selling the crop. The directors of an

association usually plan to establish a reputation for a quality product, and their first efforts are directed toward standardization. Usually skilled workers are employed to grade and pack the product delivered by individual members, and in many instances inspectors examine each car loaded for shipment to determine if it conforms to the requirements of the grade or brand under which it is offered for sale. Through capably directed associations a degree of standardization may be reached which would be difficult, if not impossible, to attain through the voluntary efforts of unorganized growers and shippers.

DIFFICULTIES IN ORGANIZING.

It has been especially difficult to organize southern sweet-potato growers because of the conditions under which the crop is produced. It is grown throughout the South rather than in certain restricted areas, production is in patches rather than fields, and the personnel of the growers is constantly changing. Sweet-potato production first developed as a home industry, and the marketing interests of many growers have been confined to the small surpluses which remained after providing for the farm family.

As production increased it became more and more difficult to dispose of these surpluses locally and merchants and traders undertook to assemble these small lots and market them in carloads in distant cities. In the past few years large storage houses and chains of houses have been built by merchants, buyers, and groups of business men. Not only has a local cash market been furnished, but the existence of commercial storage houses has given an impetus to commercial production without any radical changes in either the practices or the viewpoint of the growers, many of whom are tenants.

EARLY EFFORTS TO ORGANIZE.

As a result of the unsatisfactory marketing conditions that have prevailed in recent years, partly as a result of post-war depression, partly from increased production, and partly as a result of uneconomic practices, there has been a constantly growing interest in the possibility of marketing southern sweet potatoes cooperatively. Since 1918 numerous efforts have been made to form organizations, most of them being made by men who were not growers but who hoped to benefit the industry by organizing associations over a wide territory with the membership including growers, shippers, storage-house operators, merchants, bankers, and others who would contribute to its financial support. The growers themselves were the least interested of any of these groups, particularly in those sections where commercial houses furnished a cash market.

Most of the organizations, which were begun with the main idea of promoting the industry through national advertising and to eliminate competition by selling through a central office, never reached the stage of operation. Without detailed and fundamentally sound plans of organization and operation, they were doomed to failure. However, they brought to the attention of the grower the possibilities in collective action and helped to pave the way for future cooperative effort.

PRESENT ORGANIZATIONS.

In 1921 a wave of enthusiasm for cooperative marketing swept the South and efforts to organize the growers of the different southern crops into so-called commodity organizations were vigorously begun. The first State-wide sweet potato association to be formed and operated on a long-term contract plan was in Arkansas. At the time of incorporation in the fall of 1921 there were 25 local incorporated associations, all of which were organized on the same plan. The combined membership in the locals was approximately 600 and the total capacity of the storage houses owned or controlled was about 200,000 bushels. Marketing contracts for a period of five years are in effect between the individual members and the local associations and between the locals and the State organization. One member from each local comprises the board of directors of the State association, which directs the association through an executive committee. All sales are made by the State association, pooling is practiced, a brand is owned and used, a standard has been adopted for containers, and inspection has been carried on to a limited extent.

In Texas a State-wide association has been formed on a similar plan. It began functioning in 1922, with a reported membership of 30 locals composed of 1,500 growers. Several other States are either organizing or proposing to organize on the same plan. In South Carolina there is a State association which has in its membership most of the larger storage houses of the State, both cooperatively and privately owned. This association, which antedates the one in Arkansas, has a contract with its members which may be terminated at the end of each season. Seven men elected by the members comprise the board of directors. Pooling is practiced and all sales are made by the State association—members grading, packing, and loading under its direction.

A number of small associations exist in the different States, usually confined to small groups and restricted areas. Many of these are loosely organized and have few features which give them any degree of stability. Little attention is being given to the formation of small associations, except as units of the large associations, organized or sponsored by State and National farm organizations.

FEDERAL SERVICES IN MARKETING.

THE MARKET NEWS SERVICE.

In 1917 the Bureau of Markets (now the Bureau of Agricultural Economics) established a market news service on sweet potatoes in order to facilitate marketing by making available to the public impartial market information. During the main shipping season market reports are issued daily in mimeographed form from Washington, from one or more branch offices, and, under special conditions, at important shipping points. They contain information on the daily movement of cars by States of origin and report wholesale prices being paid each day in a number of the important markets. Reports from each of these markets give the condition of the weather, the number of cars arriving since the preceding report, the number of cars on track, and facts relative to supply and demand conditions. These mimeographed reports (fig. 19) are mailed on request to growers, shippers, dealers, and others interested. Reports are also sent by telegraph to those who desire telegraphic reports and are willing to

pay for the transmission of the messages. Requests for reports or for more detailed information regarding the service should be sent to the Bureau of Agricultural Economics, Department of Agriculture, Washington, D. C.

UNITED STATES DEPARTMENT OF AGRICULTURE

MARKET REPORT

Washington, D. C.
December 15, 1921.

1358 B Street, S. W.
Telephone-Main 4650-Br. 212.

SWEET POTATOES - NO. 127.

CARLOT SHIPMENTS FOR WEDNESDAY, DECEMBER 14:

Arkansas	2	Maryland East Shore	13
California		Mississippi	1
Northern District	2	New Jersey	6
Delaware	13	North Carolina	7
Georgia	3	Tennessee	10
Illinois	2	Texas	3
Kentucky	1	Virginia	
Louisiana	1	East Shore	1
		TOTAL	65

NOTE: UNLESS OTHERWISE STATED, ALL QUOTATIONS ARE ON STOCK OF GOOD MERCHANTABLE QUALITY AND CONDITION

SHIPPING POINT INFORMATION WEDNESDAY, DECEMBER 14:
GLEASON, TENNESSEE: Warm. Haulings light. Carloads f.o.b. cash track -

U. S. GRADE NO. 1, NANCY HALLS $1.25 - 1.35 per bushel hamper.

REPORTS BY DIRECT LEASED WIRE FROM IMPORTANT MARKETS
THIS MORNING'S SALES TO JOBBERS - UNLESS OTHERWISE STATED

CHICAGO: 32o cloudy. 2 Del., 6 Ill., 2 Ky., 3 N. J. and 3 Tenn. arrived, 14 cars on track including broken. Demand and movement light, market steady. Tennessee, bushel hampers Nancy Halls No. 1, $1.25-1.35. Illinois, bushel hampers Nancy Halls No. 1, $1.00-1.15, Little Stem Jerseys No. 1, $1.25-1.35, 7/8 bushel hampers Little Stem Jerseys No. 1 $1.00-1.10. New Jerseys, bushel hampers Big Stem Jerseys No. 1, $2.25-2.35. Virginias, cloth top stave barrels Improved Jerseys No. 1, $3.50-3.75, few $4.00. Correction: last Friday's (December 9) report price on New Jersey bushel hamper Big Stem Jerseys No. 1 should have read $2.00-2.25, poorer $1.50-1.65, instead of $1.50-1.65.

ST. LOUIS: 29o partly cloudy. 1 Tenn. arrived, no cars on track. Supplies liberal. Practically no demand or movement. Too few sales to establish market. Operators asking for Tennessees, bushel hampers Nancy Halls No. 1, kiln dried, mostly around $1.25.

ST. PAUL: 21o partly cloudy, 1 N.J. and 1 Tenn. arrived, no cars on track. Supplies moderate. Demand and movement light, market steady. New Jerseys, bushel hampers Yellow varieties No. 1, $2.65. Tennessees, bushel hampers Nancy Halls No. 1, $1.65.

H. C. Taylor,
Chief of Bureau.

FIG. 11.—Facsimile of a market report on sweet potatoes such as is issued daily during shipping season at Washington, D. C., and branch offices at important shipping points.

REPORTS OF STORAGE STOCKS.

In 1922 the Bureau of Agricultural Economics began issuing periodical reports estimating the commercial supply of sweet potatoes held in storage houses. These reports show the quantity stored at harvest time, the movement out of storage, and the quantity remaining at the time each report is made. Prior to the inauguration of this service shippers were unable to determine the extent of storage holdings

except in their immediate localities, with the result that often a large proportion of the stored crop would be held until late in the season and supplies would greatly exceed demand. In other seasons so many storage-house operators might sell during the winter that supplies would be inadequate to satisfy a later demand. Definite information furnished by these reports enables shippers to determine more intelligently when and where to sell, influences a more even distribution throughout the year, and tends to eliminate market gluts and to stabilize prices.

THE FOOD PRODUCTS INSPECTION SERVICE.

Shippers of sweet potatoes who have their cars rejected or who for any reason desire unbiased reports relative to the condition of their shipments on arrival, the grade of the product, or the amount of disease or damage may obtain reliable reports from Federal food products inspectors. These inspectors are stationed in the principal receiving markets and upon requests from shippers, receivers, railroads, or any individual or agency financially interested in the shipments, they make inspections and issue certificates which are accepted in all United States courts as prima facie evidence of the facts stated.

A certificate obtained from a Federal inspector (fig. 20) provides a reliable, disinterested report that may be used as a basis for settling disputes regarding the quantity, quality, grade, or condition of a shipment. Not only does it facilitate adjustments and prevent misunderstandings on the part of the contracting parties, but it often influences the shipper to improve grading, packing, and loading practices, thereby eliminating to a large extent the causes of rejections and disputes. The fact that Federal inspections may be requested by shippers or carriers tends to prevent sharp practices at either end of the shipment. The fee charged is so small that some shippers request inspections merely to obtain information about their shipments and to avoid the possibility of a controversy.

Information about this service, its scope, the fees charged, and the names and addresses of inspectors may be obtained by writing to the Bureau of Agricultural Economics. Inspection offices are maintained in about 30 of the largest cities, and from these offices inspections are made at all points that can be conveniently reached. Requests for inspections, however, should be made direct to the inspectors located in or near the cities where the shipments are to be inspected. A request may be made by letter, telephone, or telegraph; and should state the name of the shipper, name of the consignee, kind of product, number of the car, routing, and any other facts that might be of value in locating the car. If the shipper wants to establish only certain facts, such as the grade or the percentage of rot, this should be stated in his request. In determining grade the inspectors use the United States recommended grades. A copy of the inspection certificate is mailed to the shipper and if desired a telegram is sent collect which gives the essential facts. A telegraphic request for an inspection may be worded like the following example in order to aid the inspector in rendering prompt service:

MONTEZUMA, GA., *March 10, 1933.*

JOHN DOE,
1358 B Street SW., Washington, D. C.:

Inspect A. B. & A. car 24052 routed via Southern and containing 500 crates Porto Rico sweet potatoes consigned by me to Smith & Brown. Wire report.

A. B. ROE.

F. P. I.—1a

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

FOOD PRODUCTS INSPECTION CERTIFICATE

This certificate is receivable in all Courts of the United States as prima facie evidence of the truth of the statements therein contained.

Market Chicago, Ill. *Date* Nov. 16, 1922 *Hour* 12:30 P. M.

To John Doe (Applicant) *Address* Chicago, Ill.

Shipper John Doe *Address* Gleason, Tenn.

Receiver Brown & Smith *Address* Chicago, Ill.

I certify that in compliance with the regulations of the Secretary of Agriculture governing the inspection of food products pursuant to the Act making appropriations for the United States Department of Agriculture, I inspected, at the time and on the date stated above, the following lot of food products, and that the quality and condition, at said time and on said date, were as stated below:

Car initials and number P.R.R. 38652 *Kind of car* Plain Box *Where inspected* I. C. So. Water St.

Condition of car: One side door fastened open about 6 inches; other door entirely open and inside of doorway boarded to top.

Products inspected and distinguishing marks: SWEET POTATOES in lidded hampers stenciled "Nancy Halls" and stamped "32 quarts."

Condition of load and containers: Hampers arranged 8 rows wide with alternate hampers inverted. In one end of car 11 stacks, and in other end 5 stacks are two layers high with hampers on end. Nearer doorways several stacks of hampers are placed flat and 2 or 3 layers high.
Condition of pack: Hampers well filled and usually showing slight bulge.

Temperature of product: Not taken.

Size: Approximately 2% by weight less than 1 3/4" diameter. Most stock 1-7/8" to 2-3/4" with some 3" in diameter. Stock meets size requirements of the U. S. Grade No. 1.
Maturity; Color: Stock mature and clean.

Decay: None apparent.

Other blemishes and defects: Practically none. In a few hampers an occasional sweet potato shows slight weevil injury.

Summary—Quality; Condition; Grade: Lot meets all requirements of the U. S. Grade No. 1 and presents a clean generally bright appearance.

Remarks:

Fee
Expenses
Total

Food Products Inspector.

Address 139 No. Clark St., Chicago, Ill.

PLEASE REFER TO THIS CERTIFICATE BY NUMBER AND MARKET

FIG. 20.—Facsimile of a food products inspection certificate such as is issued by inspectors in about 30 of the largest receiving markets.

SHIPPING-POINT INSPECTION.

The need for inspections at points of origin as well as in receiving markets has led to the development of a shipping-point inspection service in a number of States. In most instances this service has been inaugurated by State departments of agriculture and with a few exceptions is conducted in cooperation with the Federal department. The use of this service, where it is now available or where it may be available in the future, should be valuable to sweet-potato shippers inasmuch as it is possible to determine the grade and condition of a shipment before it is moved. In many instances it would make central market inspections unnecessary. This service is not now available throughout the sweet-potato area, but it is being developed and extended rapidly. Its beneficial effect on shipping-point methods and practices is alone sufficient to justify shippers in cooperating with official agencies in establishing and maintaining such a service.

RECOMMENDATIONS.

It is not unreasonable to believe that under present conditions in the southern sweet-potato industry economic necessity will bring about a better adjustment in supply and demand. There is a tendency for the least efficient growers to discontinue commercial production, for the more expensively operated storage houses to become converted to other uses, and for inexperienced shippers to go out of business or combine with others in order to obtain the advantages of large-scale operations. While conditions are such that radical developments may occur to change the trend, the fact that marketing is becoming concentrated in fewer and more efficient hands tends to bring about more stability in the industry.

Growers should recognize that they have problems of production and farm management, as well as marketing. If they intend to continue growing sweet potatoes for the market, it is essential that they standardize and improve their varieties, increase their yields per acre, increase the percentage of No. 1 stock, and keep their fields disease free through proper seed selection and the adoption of better production methods and practices.

They should store for shipment or sell to storage-house operators only well-ripened, disease-free, carefully harvested potatoes that conform to the U. S. No. 1 grade in both size and quality. They should sell in local markets, eat at home, can, feed to livestock, or otherwise utilize in the producing districts all of the crop that is not suitable for shipment.

Any change from one variety to another should be made only after considering carefully local conditions, market preferences, relative costs of production, susceptibility or resistance of the variety to disease, its adaptability to soil and climate, and its keeping quality. Growers should avoid the popular but unprofitable practice of changing varieties and acreage with every temporary change in price or trade preference.

They should find it advantageous to cooperate with other growers in their respective communities in any sound, progressive plan for collectively grading, storing, curing, advertising, and selling their product.

Owners or operators of commercial storage houses should buy or should accept for storage for the grower's account only sweet potatoes that are free from disease, in proper condition for storing, and that conform to grade requirements. They should cooperate with growers in bringing about improvements in growing, harvesting, and field grading. Grading and handling at the storage house should be closely supervised, and any unnecessary waste of space, products, and labor should be eliminated. Any new houses erected should be on the track side and should be sufficiently large to make economical operation possible. In some instances storage costs per bushel may be reduced, and other advantages may result, from operating several houses under one management.

Shippers should study market conditions and should develop their sales policies accordingly. They should prepare or accept for shipment only well-graded, well-packed, disease-free sweet potatoes. These should be loaded in standard containers. Brands should be developed, advertised, and their integrity maintained. Every detail of selling and shipping should be handled in a manner to invite confidence and attract buyers. The adoption of efficient methods and practices in the producing sections should not only reduce the cost of marketing, but should make it possible for shippers to distribute the supply in the quantity and condition desired and at the time and place of greatest demand.

PUBLICATIONS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE RELATING TO THE SWEET POTATO.

AVAILABLE FOR FREE DISTRIBUTION BY THE DEPARTMENT.

Sweet Potato Growing. (Farmers' Bulletin 999.)
Sweet Potato Storage. (Farmers' Bulletin 970.)
Sweet Potato Diseases. (Farmers' Bulletin 1059.)
The Sweet Potato Weevil and its Control. (Farmers' Bulletin 1020.)
Utilization of Flue-heated Tobacco Barns for Sweet Potato Storage. (Farmers' Bulletin 1267.)
Sweet Potato Storage Studies. (Department Bulletin 1063.)
Group Classification and Varietal Descriptions of American Varieties of Sweet Potatoes. (Department Bulletin 1021.)

ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE.

December 13, 1923.

Secretary of Agriculture..... HENRY C. WALLACE.
Assistant Secretary..... HOWARD M. GORE.
Director of Scientific Work..... E. D. BALL.
Director of Regulatory Work..... WALTER G. CAMPBELL.
Director of Extension Work..... C. W. WARBURTON.
Solicitor..... R. W. WILLIAMS.
Weather Bureau..... CHARLES F. MARVIN, *Chief.*
Bureau of Agricultural Economics..... HENRY C. TAYLOR, *Chief.*
Bureau of Animal Industry..... JOHN R. MOHLER, *Chief.*
Bureau of Plant Industry..... WILLIAM A. TAYLOR, *Chief.*
Forest Service..... W. B. GREELEY, *Chief.*
Bureau of Chemistry..... C. A. BROWNE, *Chief.*
Bureau of Soils..... MILTON WHITNEY, *Chief.*
Bureau of Entomology..... L. O. HOWARD, *Chief.*
Bureau of Biological Survey..... E. W. NELSON, *Chief.*
Bureau of Public Roads..... THOMAS H. MACDONALD, *Chief.*
Bureau of Home Economics..... LOUISE STANLEY, *Chief.*
Office of Experiment Stations..... E. W. ALLEN, *Chief.*
Fixed Nitrogen Research Laboratory..... F. G. COTTRELL, *Director.*
Publications..... L. J. HAYNES, *In Charge.*
Library..... CLARIBEL R. BARNETT, *Librarian.*
Federal Horticultural Board..... C. L. MARLATT, *Chairman.*
Insecticide and Fungicide Board..... J. K. HAYWOOD, *Chairman.*
Packers and Stockyards Administration..... } CHESTER MORRILL, *Assistant to the*
Grain Future Trading Act Administration..... } *Secretary.*

This bulletin is a contribution from

Bureau of Agricultural Economics..... HENRY C. TAYLOR, *Chief.*
Division of Agricultural Cooperation..... LLOYD S. TENNY, *In Charge.*

48

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
10 CENTS PER COPY